Premise

MIRVAC

Everleigh Development

WATER SUPPLY NETWORK MODEL INVESTIGATION REPORT

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1. INTRODUCTION

Mirvac engaged Premise to undertake a hydraulic modelling investigation of the internal water supply network for a 3451 Lot Everleigh development located in the suburb of Greenbank, Logan City. The development is located off Teviot Road on land parcels described as 434/RP845844, 9/S312355 and 205/RP845844.

The development forms part of a major urban community which is under the control of Economic Development Queensland (EDQ). The gross area of the site is approximately 481 hectares and is situated in the Greater Flagstone PDA declared under the Economic Development Act 2012.

The intent of this study is to undertake an assessment of the water supply system for the development site to ensure compliance with Logan Water Infrastructure Alliance's (LWIA) Desired Standards of Service (DSS). This report also provides professional engineering advices on relevant servicing requirements for the site as new land stages are progressively released.

2. OBJECTIVES

The objectives of this study are as follows: -

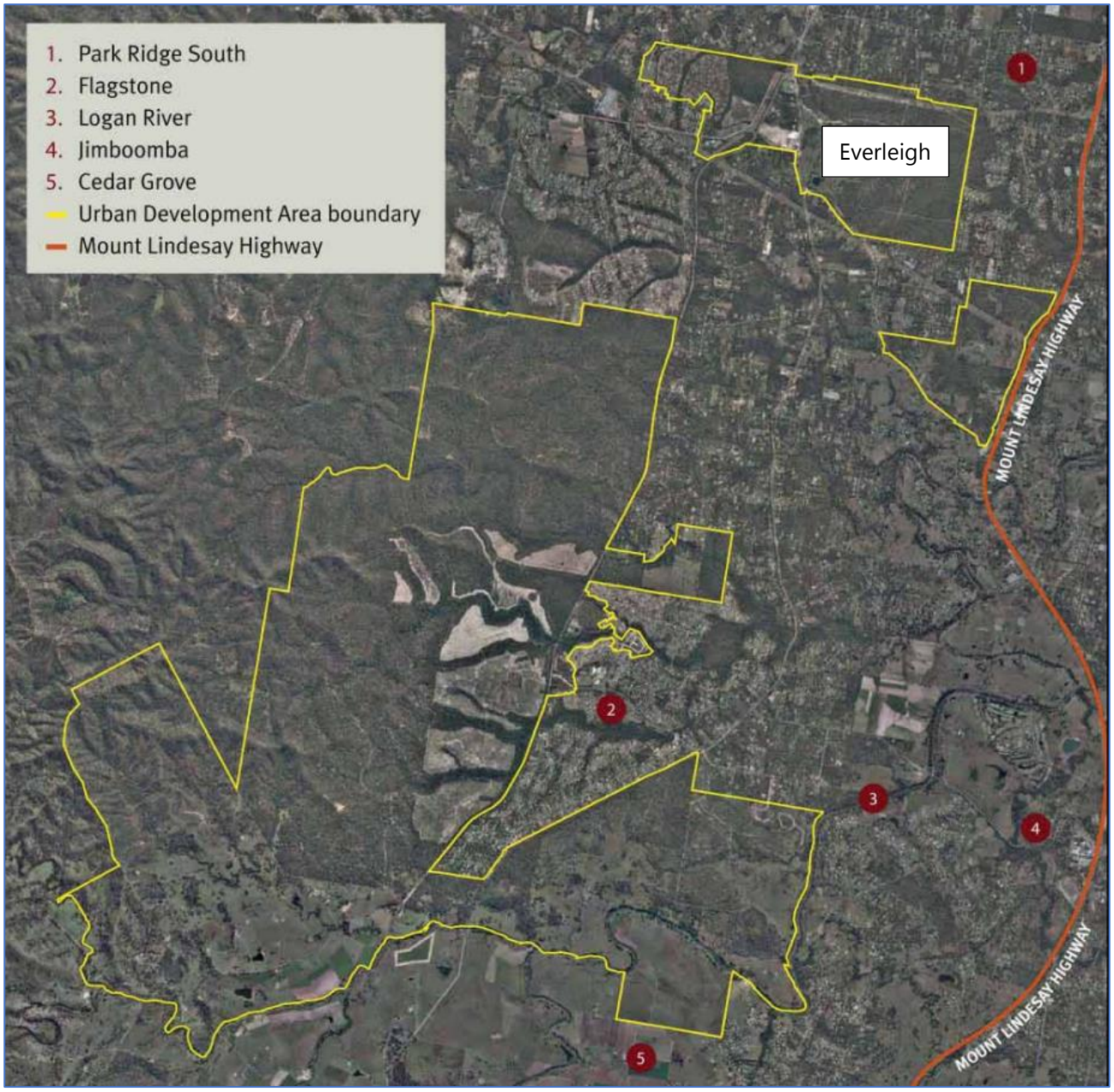
1. Review LWIAs water supply strategy reports prepared for the Greater Flagstone Priority Development Area (PDA) which includes a strategy report for the Greenbank region;
2. Establish an equivalent population estimate (EP) for the development site which includes 3,452 residential allotments, a Neighbourhood Centre, a Primary School and a Regional Sports and Recreation Park;
3. Establish a network model incorporating the as built infrastructure for Precinct 1 and school site, as well as modifications proposed by LWIA in respect to external servicing requirements;
4. Assess and identify the network infrastructure required to service demands attributable to the ultimate development population as well as any interim stages;
5. To ensure that LWIA are made aware of any inherent risks associated with servicing the development;
6. Present all findings and recommendations in a technical investigation report demonstrating that the whole of the development site can be reliably serviced in line with LWIA's Desired Standards of Service (DSS).

All investigations were undertaken in consultation with LWIA's Planning staff to ensure alignment with anticipated future direction and strategy for external infrastructure proposed for the greater Greenbank Region.

3. SITE DESCRIPTION

The proposed development site is bounded to the east by Teviot Road and Greenbank Road to the south. There are existing developed lots located on the eastern fringe of development site (these being in the Wearing Park Area). Access to the development site is currently via Teviot Road on the west side. A further (future) access to the site will be provided via Greenbank Road on the southern side once development proceeds in that particular area. A concept plan for the proposed Everleigh Development in the context of the Greater Flagstone PDA is shown indicatively below in Figure 3.1.

Figure 3.1: Greater Flagstone UDA Context Plan (extract from Greater Flagstone UDA Development Scheme)



The developable area of the site is estimated to be in the order of 397 hectares and consists of several different land uses, areas and lot yields, all of which are summarised in Table 3.1.

The total residential yield is estimated to be in the order of about 3,451 lots. An indicative lot layout and contour plan of the overall development site is included in Appendix A.

Table 3.1: Land Uses and Lot Yield

Land Use	Area (Ha)	Approximate Number of Lots
Residential (including a mixture of Standard Residential and Medium Density Residential Lots)	240	3,451
Neighbourhood Centre	5	
State Primary School	7	
Regional Sports and Recreation Park	25	
Total	**397**	**3,451**

The elevation of the developable land varies from about RL 30 (Precincts 5, 6 and 7) to RL 73 (Precinct 11 and 12).

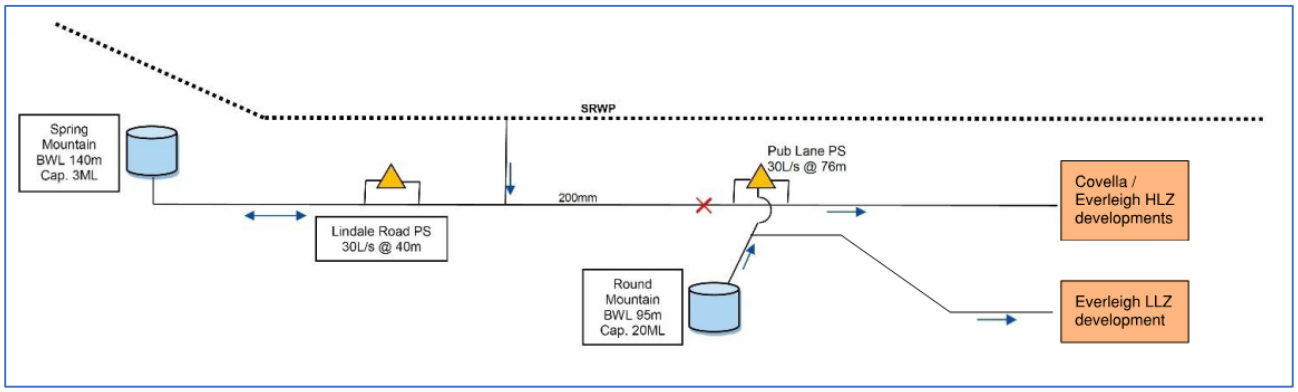
4. WATER SUPPLY NETWORK AND PROPOSED SERVICING STRATEGY

Existing developed areas within the Greater Flagstone Region are currently serviced via two main reservoirs, these being as follows: -

- Round Mountain Reservoir (BWL of RL95); and
- Spring Mountain reservoir (BWL 140m).

The above infrastructure is shown indicatively on Figure 4.1.

Figure 4.1: Schematic representation of LCC servicing strategy (Option 2, LS-021)



4.1 EVERLEIGH DEVELOPMENT AS BUILT AREAS

Mirvac has obtained approval from LCC to proceed with Precinct 1 located on the southern side of Everleigh Drive (which comprises approximately 365 Lots) and the school site and associated infrastructure which is located centrally within the development. At the time of writing this report, individual lots within Precinct 1 were being sold and developed and construction on the bulk earthworks and roadworks for the school site had commenced.

Water supply to Precinct 1 and the school site is currently sourced from the Teviot Road trunk main which under the present distribution strategy is supplied from Spring Mountain Reservoir which has a BWL at RL140. To ensure network pressures are maintained within DSS guidelines, a pressure management device has been installed on the DN250 supply offtake from the existing Teviot Road trunk main.

4.2 LWIA PROPOSED SERVICING STRATEGY

The current water supply servicing arrangement supplying new and existing developed areas in the Greenbank region is proposed to be modified. According to LWIA's Planning and Investigation Report for the Greenbank Region (Ref 4), all elevated areas located within the proposed "Everleigh" and the "Covella" development sites will be serviced via a pressure boosted supply from Round Mountain reservoir. The works will be facilitated via the implementation of a second set of pressure boosting pumps in the existing Pub Lane Pump Station.

Developed areas located on the western side of Pub Lane Pump station will be serviced via existing Pub Lane pumps as well as the Lindale Road Pump Station boosting supply into Spring Mountain Reservoir. The regions

located to the west of Pub Lane Pump station are not the subject of this investigation and have not been considered further in this report.

In summary, under the revised servicing strategy, allotments situated on land with elevation less than RL50 will be serviced directly from Round Mountain reservoir via the existing trunk main along Greenbank Road. All elevated allotments (i.e. land parcels situated on land with elevations greater than RL50) will be serviced via the proposed boosted supply arrangement from Pub Lane pump station.
Further information concerning LWIAs proposed servicing strategy for the Greenbank and surrounding areas is provided in the above referenced report. A schematic representation of LWIAs proposed servicing strategy is presented in Figure 4.1.
The proposed Everleigh development will be provided with a network of reticulation mains which will be adequately sized to service the water supply and firefighting needs for all developed lots. All water infrastructure will be designed according to the SEQ Code, LWIA development guidelines and other guidelines and standards referenced herein this report.

The elevated region of the Everleigh network, i.e. all allotments and land parcels situated on elevated land above RL50 are hereafter referred to as the High-Level Zone (HLZ). The region containing allotments and land parcels on land less than RL 50 is referred to as the Low-Level Zone (LLZ).

5. EQUIVALENT POPULATION ASSESSMENT

The Everleigh development will comprise a combination of approximately 3,451 residential allotments, a Neighbourhood Centre, a Primary School and a Regional Sports and Recreation Park. The equivalent population corresponding to each land use has been determined based on values provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement for residential land use whereas non-residential uses have been estimated based on values provided in the approved IMP (ref 6).

The network model has been produced based on a development layout that has a density which is considered as the projected upper limit for the site. Adopting the upper limit provides flexibility within the model for protentional future planning layout alterations.

The use conversion factors (EP/unit), as provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement, has been adopted in the network modelling and can be found Table 5.1 below.

Table 5.1: Demand Limit – Use Conversion Factors (Greater Flagstone PDA Sub-Regional Infrastructure Agreement)

USES			CONVERSION FACTORS
Residential Uses	Pre 1 January 2016	detached dwelling	2.91EP/dwelling
		attached dwelling	1.83EP/dwelling
	On or after 1 January 2016 7 Ha	detached dwelling	2.8EP/dwelling
		attached dwelling	1.78EP/dwelling
Retail uses (excluding showrooms)			30EP/ha
Showrooms			30EP/ha
Commercial uses			30EP/ha
Industrial uses			30EP/ha
Service, community and other uses (excluding child care centre and educational establishment)			30EP/ha
Child Care Centre			0.25EP/pupil and staff
Educational establishment	Primary school		0.1EP/pupil and staff
	Secondary school		0.1EP/pupil and staff
	Any other educational establishment		0.1EP/pupil and staff
Sport, recreation and entertainment uses			30EP/ha
Tourism uses			30EP/ha
Rural uses			30EP/ha
Mixed use (being a development combining residential uses and any other use)			The conversion factor for the Residential uses and, if the mixed use includes a Child care centre or Educational establishment, the conversion factor for the Child care centre and Educations establishment (as applicable and as set out above) plus 15EP/ha
Any other uses			30EP/ha

A summary of the population estimates for each land use within the development site is presented below in Table 5.2.

Table 5.2: Equivalent Population (EP) Assessment

Land Use	Dwellings	Unit Rate	Residential EP	Non-residential EP	Total EP
Residential use – detached dwelling	3,159	2.8EP/dwelling	8,845	-	8,845
Residential use – detached dwelling	674	1.78EP/dwelling	1,199	-	1,199
Retail uses (excluding show rooms)	-	30EP/ha	-	102	102
Showrooms	-	-	-	-	-
Commercial uses	-	-	-	-	-
Industrial uses	-	-	-	-	-
Service, community and other uses	-	30EP/ha	-	96	96
Child care centre	-	-	-	-	-
Educational establishment	-	1.05EP/ha*	-	368*	368*
Sport, recreation and entertainment uses	-	-	-	26#	26#
Tourism uses	-	-	-	-	-
Rural uses	-	-	-	-	-
Mixed use	-	-	-	-	-
Any other uses	-	-	-	-	-
Total	**3,833**		**10,045**	**592**	**10,636**

* It was determined that the nominated Greater Flagstone PDA Sub-Regional Infrastructure Agreement value for the school site was too low and hence this higher EP value has been adopted (1.05 EP/Ha.
# Value was adopted in accordance with the EDQ approved MWH Water and Sewer IMP.

The approximate fraction split in population between the HLZ and LLZ within the Everleigh development is estimated to be in the order of about 60 / 40 respectively.

Initial staging for the proposed Everleigh development has already commenced with Precinct 1 (which comprises approximately 365 Lots) located on the south side of Everleigh Drive and the Primary School site located on the northern side of Ivory Parkway. Future development will generally proceed in a northerly clockwise direction (away from Everleigh Drive) in line with the staging plan presented in Appendix B.

Based on the approved Water and Sewer Infrastructure Master Plan (ref 6) for Everleigh, the uptake (or sales) of residential allotments in Everleigh is estimated to be in the order of about 18 lots per month or 216 lots per year. Based on these figures, growth in residential and non-residential lots (as well as population) can be calculated, refer Table 5.3 below.

Table 5.3: Everleigh Development Population Projections

Planning Horizon	Residential EP	Non-Residential EP (1)	Total
2020	365 detached dwellings @2.8EP/dwelling = 1,022EP		1,022EP
2025	1,333 detached dwellings @2.8EP/dwelling = 3,979EP 167 attached dwellings @1.78EP/dwelling = 297EP	State Primary School (368EP) Neighbourhood centre (198EP) Sport & Recreation (26EP)	4,868EP
2030	2,378 detached dwellings @2.8EP/dwelling = 6,658EP 279 attached dwellings @1.78EP/dwelling = 497EP	State Primary School (368EP) Neighbourhood centre (198EP) Sport & Recreation (26EP)	7,747EP
2035	3,159 detached dwellings @2.8EP/dwelling = 8,845EP 674 attached dwellings @1.78EP/dwelling = 1,199EP	State Primary School (368EP) Neighbourhood centre (198EP) Sport & Recreation (26EP)	10,636EP
Ultimate	**10,044EP**	**592EP**	**10,636EP**

The proposed development layout for Everleigh is subject to change as planning for the development continues to occur. Revision to the configuration and sizing of water mains and related infrastructure may be required if the lot yield or development layout was to change significantly to that assessed herein.

Further to the above, the rate of population growth within the subject region is based on advices of developers and service providers. Projections given herein should be considered as indicative only and be subject to an ongoing review by the developer.

6. WATER DEMANDS

6.1 Residential and Non-residential water demands

In accordance with LWIAs Desired Standards of Service (DSS) (Ref 1), an average day potable water demand (AD) of 165 L/EP/day has been adopted for this study. In addition to this demand, an "unaccounted for" water allowance of 25 L/EP/day has also been factored into the assessment.

A summary of the demands and peaking factors adopted for this investigation are summarised in Table 6.1.

Table 6.1: Design Parameters - Water Demands and Modelling Factors

Parameter	Adopted Value	
	Residential	**Non-Residential**
AD Demand	165 L/EP/day	165 L/EP/day
Unaccounted for	25 L/EP/day	25 L/EP/day
MDMM / AD Ratio	1.3	1.2
MD / AD Ratio	1.7	1.3
PH / AD Ratio	3.1	2.0

AD = Average Day
MDMM = Mean Day Maximum Month
MD = Maximum Day
PH = Peak Hour

Based on the population assessment and demand factors, the equivalent maximum day demand for Everleigh is estimated to be in the order of about 39 L/s excluding irrigation and firefighting demands. Peak hour demands may be as high as 67 L/s. Refer below for LWIA's requirements relating to firefighting and irrigation demands.

6.2 Firefighting

In accordance with LWIA's DSS, design firefighting flow rates for the likes of residential and commercial development in the Logan Region is 15 L/s (2 hours) and 30 L/s (4 hours) respectively. The minimum network pressure criterion during a firefighting event is 12 metres at the property boundary to the subject site and at any point within the network. Firefighting demands are to be applied to the model simultaneously when background demands are equivalent to two thirds of peak hour (PH).

6.3 Irrigation

It is being proposed that parks and general open space within the development site will be irrigated using harvested stormwater as the primary source of supply. Mirvac have advised that when stormwater supply source is unavailable, the potable water network may be needed from time to time to supplement irrigation demands. For this reason, the potable water network will need to be sized to ensure that irrigation demands can be accommodated.

Table 6.2 presents a summary of the likely irrigation areas and corresponding irrigation demands considered for this assessment.

Table 6.2: Irrigation Demands

Area	Approx. Area (Ha)	Irrigation Demand (L/s)	Irrigation Times (hrs)	Precinct
Low Level Zone				
Major Linear Park 801 (I-01)	0.79	1.8	4	P1
Regional Recreation Park 802 (I-02)	1.52	3.5	4	P1
Neighbourhood Park 803 (I-03)	0.50	1.2	4	P1
Regional Recreation Park 804 (I-04)	1.04	2.4	4	Between P1 & P9
Regional Recreation Park 805 (I-05)	0.54	1.2	4	Between P1 and BSF
Neighbourhood Park P3 (I-06)	0.53	1.2	4	P3
Park P9 (2 areas) (I-10)	0.97	2.2	4	P9
Sports and Rec Park	24.6	37.9 (reduced by 40% = 21.7 L/s) – Refer note 1	6	Sport & Rec Park
Elevated Level Zone				
School (50%)	3.50	5.4	6	School
Park P3 (I-07)	0.27	0.6	4	P3
Park P5 (I-08)	0.46	1.1	4	P5
Neighbourhood Park P6 & P8 (I-09)	2.34	5.4	4	P6
Park P10 (3 areas) (I-11)	0.87	2.0	4	P11
Neighbourhood Park P11 (I-12)	0.72	1.7	4	P11
Park P11 (I-13)	1.27	2.9	4	P11

1. In the interest of limiting the instantaneous application rate and to avoid oversizing of water mains, the irrigation rate for the Sports and Recreation Park was adjusted to a marginally lower value.

7. HYDRAULIC MODELLING

7.1 Referenced Standards and Guidelines

Standards, codes and design guidelines considered relevant to this investigation are referenced in Section 10 of this report.

7.2 Model Establishment

Below is a summary of the parameters, assumptions and limitations adopted for the purpose of model establishment and analysis.

- The network model was established and assessed using Bentley WaterCAD Connect Series 2 software using the Extended Period Simulation functionality over three (3) consecutive maximum days (MD). It is noted for the purposes of providing modelling files to LCC / LWIA for their review, model output files will be provided directly from Bentley WaterCAD.
- The network model was developed and assessed accordance with the requirements of (in order of precedence):
    - Greater Flagstone PDA Sub-Regional Infrastructure Agreement;
    - LCC's / LWIA's Desired Standards of Service (DSS);
    - SEQ Design & Construction Code
- The external servicing strategy for Everleigh is based on Option #2 outlined in LWIA's Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021 (Revision E.1 dated 05/07/2018), stating that elevated regions will be serviced via a pressure boosted supply from Round Mountain and that non-elevated areas will be supplied via gravity from Round Mountain.
- Confirming that as per the correspondence received from LWIA (refer attached email dated 23/01/2020) a second connection will be provided into the estate off the Teviot Road trunk main into the HLZ. This is currently planned to occur at the intersection of Leanne Court / Teviot Road / Anderson Drive.
- It is assumed that the existing pressure management device (PRV) installed on Everleigh Drive which connects to the 300mm dia Teviot Road trunk main (i.e. to manage pressures within Precinct 1) will remain as the primary point of supply to the Elevated Zone (ELZ) until such time as the future stages are brought online in alignment with the current planned development staging. It is anticipated that an additional PRV will be required off the second connection into the HLZ at the intersection of Leanne Court / Teviot Road / Anderson Drive.
- The whole of site modelling has assumed that all currently designed / constructed water mains in Precinct 1, Ivory Parkway and the School Site will remain and will not be changing – i.e. these being fixed elements in the model.
- Under the ultimate supply strategy for the development, the high-level Pressure Zone (HLZ) is defined as all land situated above RL50 whereas allotments situated on land less than RL50 fall within the Low-level Pressure Zone (LLZ) which is supplied directly from Round Mountain Reservoir;
- The model for Precinct 1 within the Bentley WaterCAD model was established based on As Constructed / design plans.
- The model for future precincts was established based on the internal road network, allotment layout plans and latest master planning advice provided by Mirvac.
- Nodal elevations were based on the most recent whole of site bulk earthworks modelling completed by Premise.

- Boundary Conditions (BCs) were modelled as fixed Hydraulic Grade (HGL) conditions for the respective pressure zones under the ultimate peak hour demand and firefighting conditions (refer LWIA correspondence in Appendix C). A summary of the Boundary Conditions advised by LWIA for the respective pressure zones within the Everleigh Network are as follows.

Zone	BC (HGL m)
LLZ (Greenbank Rd)	85m
HLZ (Teviot Rd Spring Mountain Supply Zone)	120m
HLZ (Teviot Rd LWIA revised servicing strategy for Greenbank)	107m

- BCs are generally representative of the lowest possible HGL value experienced during peak hour demands. Maximum (off peak) pressures at the external connection locations were not advised by LWIA;
- The boundary between pressure zones is designated within the model via the absence of a pipe link or by inactive pipe topology;
- The following friction factors were adopted for internal reticulation mains within the model.

Pipe Size	HW C Factor
< = 150	110
150 to <= 300	120
>300 < = 600	130

- Average Day (AD) demands were applied to the model based on EP determinations, corresponding unit demands and unaccounted for water use defined in Sections 4 and Section 5 of this report;
- Demands were factored by a MD/AD ratio of 1.7 for residential areas and 1.3 for non-residential areas;
- Separate diurnal demand patterns were applied to the model for residential areas and commercial regions with maximum hour (MH) peaking factors of 1.83 (for residential areas) and 1.54 (for commercial areas);
- Firefighting demands were applied to the model based on LWIA DSS requirements;
- Non-essential demands (e.g. irrigation) were applied during off peak periods (e.g. midnight through 4am).
- External water storage upgrades were not assessed. It is assumed that LWIA will examine the requirement for upgrading existing storage reserves to support all approved future development within the region and that is not part of this assessment.
- Minimum pressure and related performance requirements for onsite irrigation appliances were not assessed. In instances whereby an onsite irrigation system requires a minimum pressure and/ or performance requirement over and above what can be provided by the Water Authority (which is what has been allowed for in our modelling), it is assumed that the respective property owner will design their own onsite infrastructure to ensure adequate service is able to be provided.
- In respect to firefighting, AS2419 may necessitate the need for fire hydrant coverage for the likes of a commercial development with a performance capability different (or potentially more onerous) to that required by LCC's / LWIA's Desired Standards of Service (DSS). In the event that an individual property (e.g. School) requires fire hydrant coverage and performance over and above the performance that LWIA can provide and the whole of site water model has allowed for, the property or lease owner will

need to assess and design their own onsite infrastructure to service such firefighting requirements in line with the relevant Australian Standard/s. Design firefighting requirements set down within AS2419 and related Australian Standards have not been assessed nor considered herein this report.

- It is assumed that all risks associated with the external servicing strategy (including provision for alternative supply) for the broader Greenbank area rests with the Water Authority and have not been considered in our whole of site water modelling.

7.3 Network Assessment

A hydraulic analysis was undertaken to assess the infrastructure required to service the proposed interim and ultimate stages of the Everleigh Development. A progressive approach was adopted to examine the behaviour and capacity of the network when subject to: -

- Interim "existing" Everleigh development demands (i.e. baseline demands from P1 and the School site);
- Interim "staged" Everleigh development demands (i.e. future demands attributable to P7 through P13); and
- Ultimate development demands (i.e. demands attributable to all precincts).

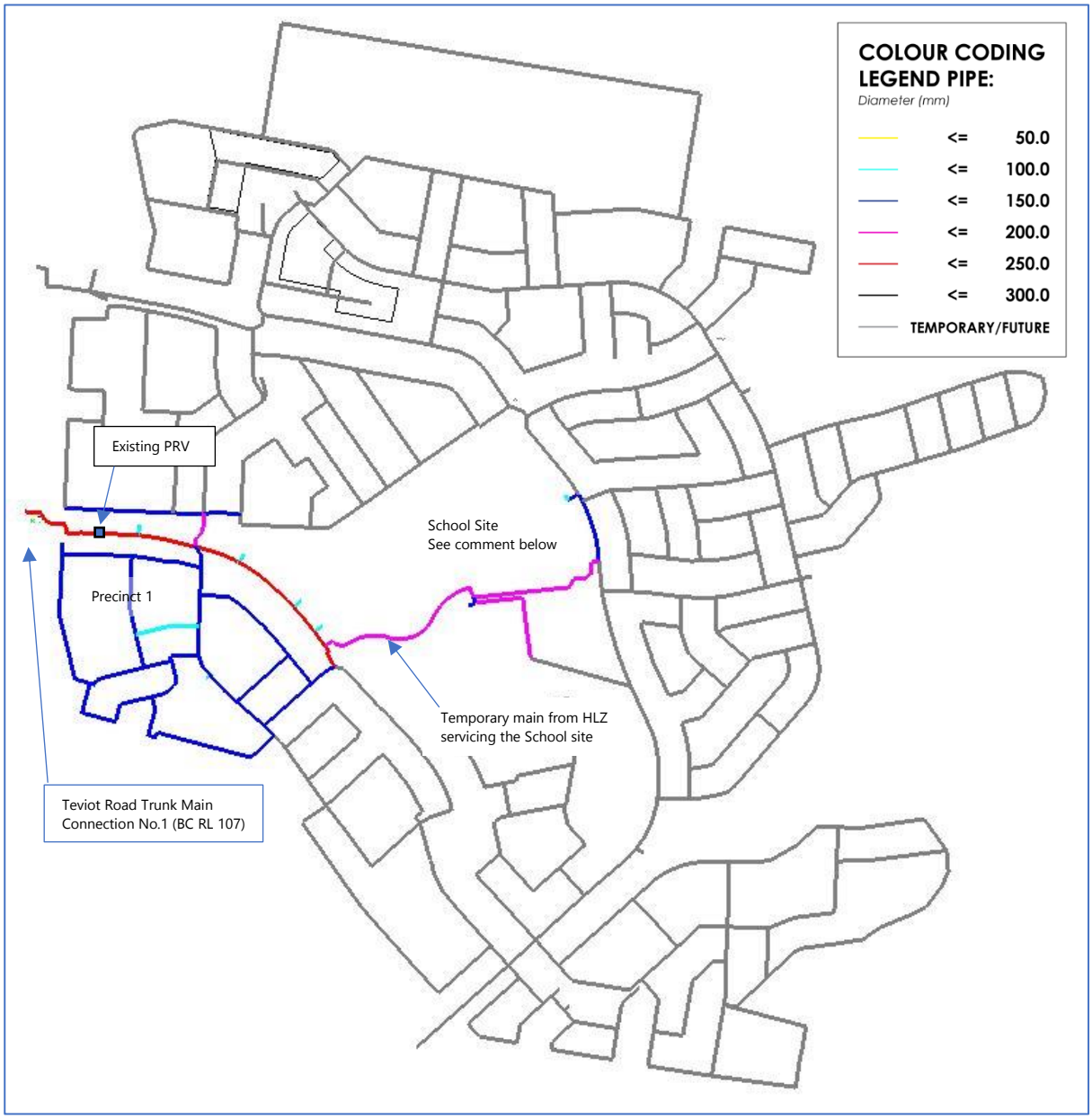
Results from the hydraulic modelling assessment are discussed and summarised in the following Sections. A full outline of the WaterCAD model output results including nodal and pipe flow parameters have been provided in Appendix E.

7.3.1 INTERIM DEVELOPMENT STAGE (PRECINCT 1 AND SCHOOL SITE)

Figure 7.1 presents an illustration of the water infrastructure servicing P1 as well as the temporary infrastructure servicing the school site. It should be noted that at the time of writing this report, all water mains indicated in Figure 7.1 had been constructed and were in service.

The water mains indicated in grey represent the water main layout attributable to future Precincts. The same colour coding applies to Figures 7.2 and 7.3.

Figure 7.1: Interim Development Stage (Precinct 1) and School Site (Existing Built Infrastructure)



At the time of writing this report, the water mains indicated in Figure 7.1 had already been constructed and were in service.

The school site was being serviced via a temporary DN200 main running in an easterly direction from the HLZ along Ivory Parkway and then along Anderson Drive as indicated by the pink and blue line shown on Figure 7.1. The main from the HLZ servicing the school site is considered temporary only until such time as the LLZ supply main from Round Mountain pressure zone (i.e. connection to Greenbank Road trunk main) is constructed.

Results from the modelling assessment for the existing network servicing Precinct P1 and the School are summarised as follows: -

The assessment revealed that all allotments within Precinct 1 are able to be serviced via a single connection to the Teviot Road trunk main (as indicated in Figure 7.1 above);

The maximum allotment elevation within Precinct 1 is estimated to be about RL 66. To ensure that pressures within P1 and school site comply with LWIA's DSS, it is recommended that the PRV be set to maintain downstream pressures at a value not exceeding RL96. Based on the PRV set point value, pressures were assessed to be about 30m at the highest elevated lot in P1and about 52m at the school site.

The existing PRV must remain in service until such time as the LLZ supply main from Greenbank Road is constructed and placed into service. Pressure settings for the PRV will most likely need to be continually adjusted as new land stages (at higher elevations) are progressively released.

When the network was subject to firefighting demands, pressures in P1 and in the vicinity of the school site remained well in excess of 12m;

Hydraulic losses and velocities in network pipes during peak hour demands remained well within DSS guidelines.

A summary of the model results for Precinct 1 are presented in Appendix D of this report.

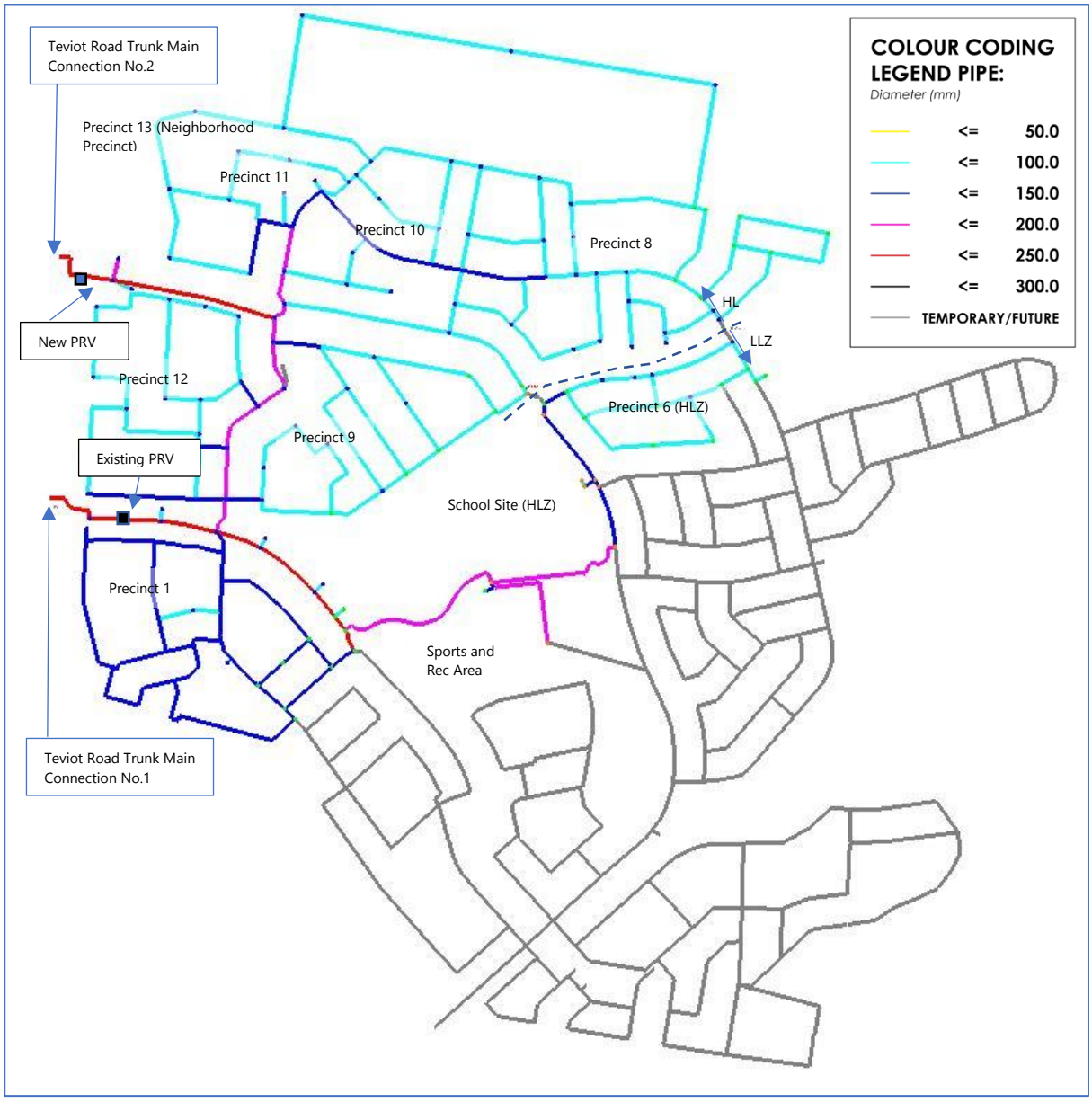
7.3.2 INTERIM DEVELOPMENT STAGES (P6 TO P12)

Mirvac is planning to develop the elevated regions of the Everleigh development initially as shown in the preliminary Precinct Staging Plan presented in Appendix B. The sequence of development will generally proceed in a clockwise direction commencing with P12 located immediately north of Everleigh Drive followed by P9 etc. The intended construction sequence for the various Precincts within the Everleigh Development is as follows.

- Precinct 1 (P1) – HLZ (existing);
- School Site (PS) – HLZ (existing);
- Precinct 12 – HLZ;
- Precinct 9 – HLZ;
- Precinct 13 (Neighbourhood Centre) – HLZ;
- Precinct 10 – HLZ;
- Precinct 11 – HLZ;
- Precinct 8 – HLZ;
- Precinct 6 – LLZ;
- Precinct 7 – LLZ;
- Precinct 5 – LLZ;
- Other Precincts (refer ultimate servicing scenario).

Figure 7.2 presents an illustration of the hydraulic model layout for the above mentioned HLZ Precincts as well as an interim servicing option for P6.

Figure 7.2: Interim Development Stage (Precincts 1, 6 and 8 to 12) and School Site



Comments in respect to the water modelling assessment for the above described interim staging plan are as follows.

Demands attributable to the above-mentioned precincts (i.e. all of the HLZ) will not be able to be accommodated via a single connection to the Teviot Road trunk main. The assessment revealed that the second connection to Teviot Road trunk main is required to ensure that network residual pressures (particularly within the developable regions located above RL70) and head loss gradients for internal reticulation are maintained within DSS limitations.

Further to the above, advice received from LWIA suggested that the provision of a single connection only to the HLZ (i.e. from the Teviot Road trunk main) may present a significant risk in that, if the primary point of supply from Teviot Road trunk main was removed from service for maintenance, repair or other reason, continuity of supply to approximately 2,300 customers will be disrupted. Accordingly, for this reason, LWIA

have requested Mirvac to provide a second connection to the HLZ from the existing Teviot Road trunk main to mitigate this risk.

With both external connections in place, all allotments are able to be reliably serviced in line with LWIA's DSS.

It is recommended that the second Teviot Road connection be constructed prior to developing P13 or any land located at RL70 or above.

To ensure compliance with LWIA's DSS in respect to minimum service pressures for Precincts P8 through P12 (with a maximum internal elevation of RL73) it is recommended that the PRV be set at a value to maintain internal network pressures not exceeding RL105. In the event that the School site is to be supplied via the temporary connection from the HLZ, the assessment revealed that pressures in the vicinity of the school site may exceed the maximum target pressure of 55m albeit only marginally. For this reason, it is recommended that Mirvac consult with the site engineers for the school and advise that marginally higher pressures may warrant installation of pressure management devices on the domestic water connections.

According to the preliminary staging plan, following completion of Precinct P8, future land stages (including P7) will generally proceed in a southerly direction towards Greenbank Road. Under the ultimate development scenario, Precinct P7 will be serviced via the LLZ connection from Greenbank Road. To facilitate the preferred interim staging for Precinct P7, two options have been considered, these being as follows: -

- construct a temporary cross connection main from the HLZ; or
- bring forward the capital works (i.e. trunk main from Greenbank Road) in advance of development works for within the LLZ.

Based on a review of the above options, the latter option may result in low pipeline flows and poor turnover in the distribution system (particularly during the early stages of development of P7). Such circumstances may impact on potable water quality (i.e. deterioration in free chlorine residual within the network) at the point of use and is hereby not recommended at this stage.

To avoid the need to manage concerns with water quality, it is recommended that Mirvac seek approval from LWIA to implement a temporary cross connection from the HLZ initially to service the properties in P7 above say RL45 (i.e. before constructing the supply main from Greenbank Road). Pressures in P7 will most likely exceed maximum target pressures if serviced via the HLZ albeit only marginally.

Development of the northern sections of Precinct P7 or a portion thereof should be sufficient to facilitate turn over in the distribution network which in turn will reduce the risk of incurring water quality issues when the trunk main from Greenbank Road is eventually constructed and placed into service.

Results from the hydraulic modelling assessment for Precincts P7 through P12 are summarised as follows. The assessment assumes that Mirvac will proceed with the option to service elevated properties (above RL45 in Precinct P7) via the temporary connection from the HLZ as described.

The assessment revealed that all allotments are able to be reliably serviced via the two independent connections to the external Teviot Road trunk main. With the two connections in service, hydraulic losses and pipe velocities within the HLZ distribution system during PH demands remained well within DSS guidelines and associated DSS parameters.

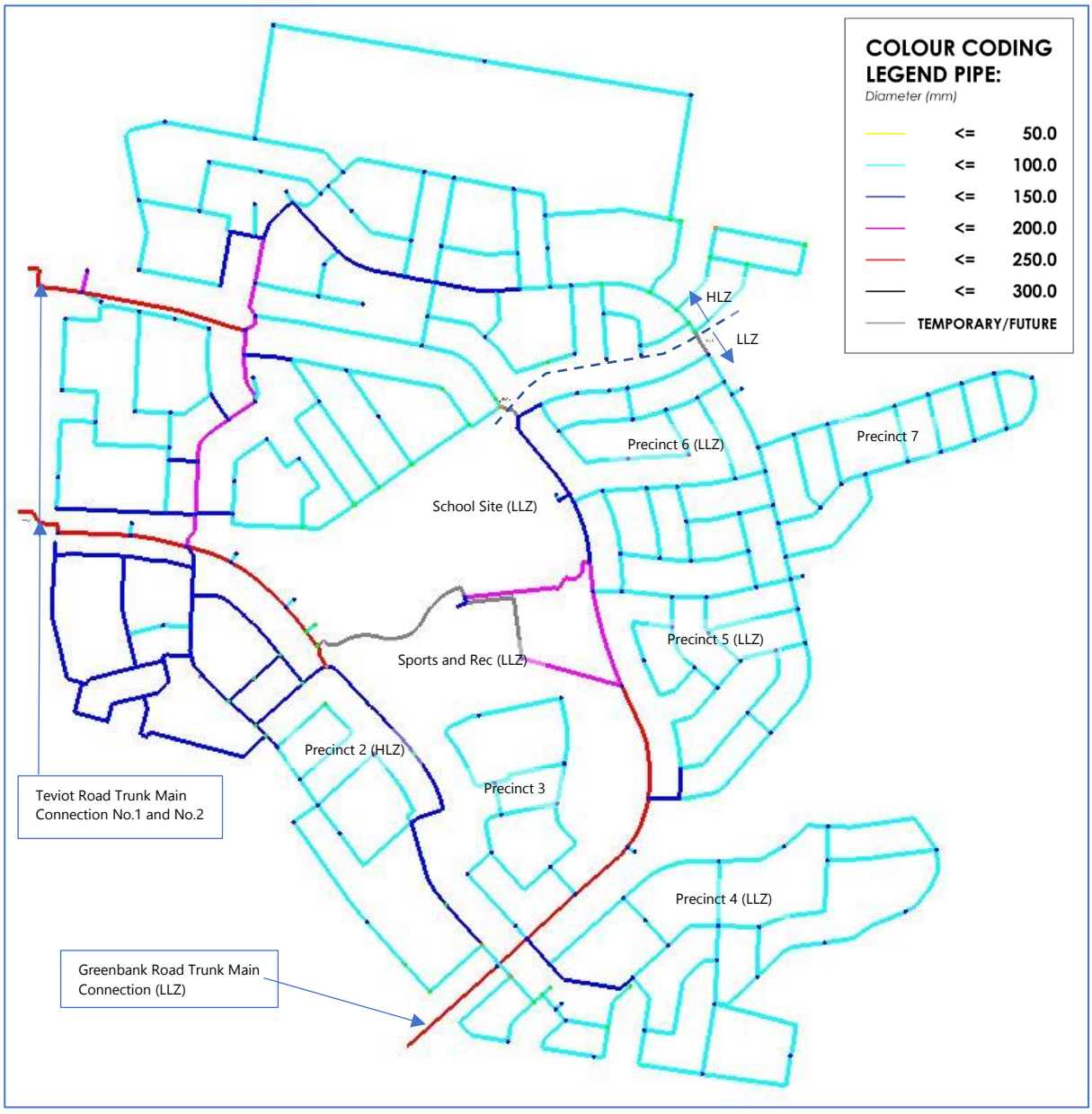
When subject to firefighting loads (i.e. 15 L/s for residential and 30 L/s for commercial), pressures within Precinct 6 and 8 through 12 remained well in excess of 12m.

A summary of the model results for the nominated interim stages of the development are presented in Appendix D of this report.

7.3.3 ULTIMATE DEVELOPMENT

Figure 7.3 presents an illustration of the mains layout and hydraulic model for ultimate development scenario for Eveleigh. The temporary infrastructure provided to service interim stages of the Everleigh development as described in the previous section is assumed to be decommissioned prior to proceeding with developing future precincts under the ultimate scenario.

Figure 7.3: Ultimate Development



The extent of the HLZ and LLZ split is as designated in Figure 7.4.

Figure 7.4: HLZ and LLZ Water Network

The capacity of the ultimate Everleigh network was examined using the hydraulic model. The assessment work revealed that: -

The proposed network of mains has sufficient capacity to accommodate ultimate demands within both the HLZ and LLZ via the connection points to the external network at Greenbank Road and Teviot Road for the LLZ and HLZ respectively.

Based on the Boundary Condition advice for Greenbank Road trunk main, there is adequate pressure available in the network to service all elevated allotments up to and including RL50.

Ultimately, once all Precincts have been constructed and the external supply strategy has been modified, it is recommended that further hydraulic modelling be undertaken to confirm whether the PRV installed on the

Teviot Road trunk main offtake will be required (as it is understood that the original intent of the PRV assembly was to manage pressures from the Spring Mountain supply zone). If Pub Lane pump station is able to provide reasonably consistent and constant pressures to the serviced areas in the HLZ, there may be grounds to consider decommissioning the PRV as commented on above.

The proposed DN250 water main supplying the low-level zone from Greenbank Road (as well as a minor number of internal network mains in both the HLZ and LLZ) exceeded the recommended guideline value for head loss when irrigation demands were applied albeit only marginally. Having said this, pressures in the HLZ and LLZ remained in excess of the minimum DSS pressure criterion at all times. Accordingly, it is not recommended that internal network mains be upgraded simply for the purposes of irrigation as the potable water network in this instance is not the primary source of supply for the proposed irrigation demands.

Figure 7.3 illustrates the recommended permanent solution for all internal water supply network mains for the Everleigh development.

The output reports for residual pressures and other relevant network characteristics within the HLZ and LLZ under the ultimate development scenario are presented in Appendix D of this report.

7.4 OPERATIONAL RISK

Supply to the Everleigh development is proposed to be managed via independent connections from Greenbank Road (for the LLZ) and Teviot Road (for the HLZ).

Based on the assessment undertaken, the network is considered capable of reliably servicing development demands. However, in the event that either external connections are taken out of service for whatever reason, there is a risk that supply to a substantial number of customers will be interrupted. Such events may impose significant undue nuisance to the Service Provider by way of having to address numerous customer complaints and the like in respect to unplanned service outages and the like.

During the course of the investigation, LWIA requested that a secondary connection be provided to the HLZ from Teviot Road trunk main as a means to mitigate the risk.

For the LLZ, only one connection has been proposed (this being from Greenbank Road) to service approximately 1150 allotments as well as the School and Sports and Recreation facility. LWIA was consulted during the course of the project regarding the provision of a single point of supply to the LLZ. The consultation with LWIA also included a discussion in respect to the potential risk associated with the loss of supply if the Greenbank Road service was disrupted for whatever reason.

A subsequent agreement was reached with LWIA, this being to implement provisions for a cross connection with a temporary pressure management device (i.e. between the HLZ and LLZ) to facilitate supply continuity to the LLZ when the Greenbank Road service is disrupted.

Correspondence between Mirvac's appointed consultants and LWIA in respect to this matter is presented in Appendix C of this report.

8. SUMMARY

Below is a summary of the conclusions drawn from this report.

1. The current external strategy report relevant to the Everleigh Development is the Logan Water Infrastructure Alliance (LWIA), Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021. All referenced documents are listed in Section 10 of this report.
2. The recommended External Servicing Strategy for the Everleigh development is Option 2 indicating that elevated allotments (i.e. allotments above RL 50) be serviced via the boosted supply arrangement from Round Mountain. The remaining regions within the development site (i.e. LLZ) is proposed to be supplied via gravity from Round Mountain reservoir supply zone;
3. The equivalent population (EP) applicable to the overall Everleigh Development is estimated to be in the order of 10,636 EP (inclusive of residential and non-residential population);
4. A WaterCAD model was developed to model existing as built works (i.e. for P1 and temporary infrastructure to servicing the school site). The model was extended to include future proposed water infrastructure needed to service interim and ultimate demands within the respective precincts for the Everleigh development. Refer Figures 7.1 through 7.3 for the proposed water infrastructure and network layouts.
5. The PRV settings may need to be adjusted as new land stages are progressively released (i.e. to ensure adequate service pressures are delivered to elevated allotments). It is recommended that Mirvac notify the site engineers at school and advise them of the anticipated marginally higher residual pressures (in the short term whilst the site is supplied from the HLZ). Further, the engineers may opt to consider the installation of temporary pressure management devices on their domestic water connection
6. The preferred staging plan for Everleigh is to commence developing Precincts P12, P9, P13, P10, P11, P8 (all of which lie within the HLZ) followed by P6 and the balance of land located on the southern side of P6 in the LLZ. Servicing of Precincts in the HLZ can be achieved by simply extending the network in a northerly direction in line with the main sizes recommended in Section 7.
7. The second Teviot Road connection to the HLZ is required prior to developing P13 or any land located at RL70 or above.
8. The recommended interim servicing requirements for Precinct P6 is to supply all lots above RL45 via a temporary cross connection from the HLZ and seek a relaxation of the DSS maximum target pressure from LWIA until such time as the supply main from Greenbank Road is constructed.
9. The recommended action to service P6 from the HLZ will ultimately reduce the risk associated with incurring adverse water quality issues (i.e. in the event that servicing P6 from Greenbank Road proceeds in advance of development);
10. Operational risk issues associated with the development have been identified as part of the assessment, this being in relation to the provision for alternative servicing requirements for the respective internal pressure zones in the event that external supply was interrupted for any length of time. Provisions to implement a second connection to the HLZ has been stipulated as a requirement by LWIA whereas nothing has been specifically mentioned for the balance of land supplied from Greenbank Road. A recommendation has been made to raise this issue with LWIA for consideration with the intent to de-risk the process leading into the operational works stage for future Precincts.

9. RECOMMENDATION

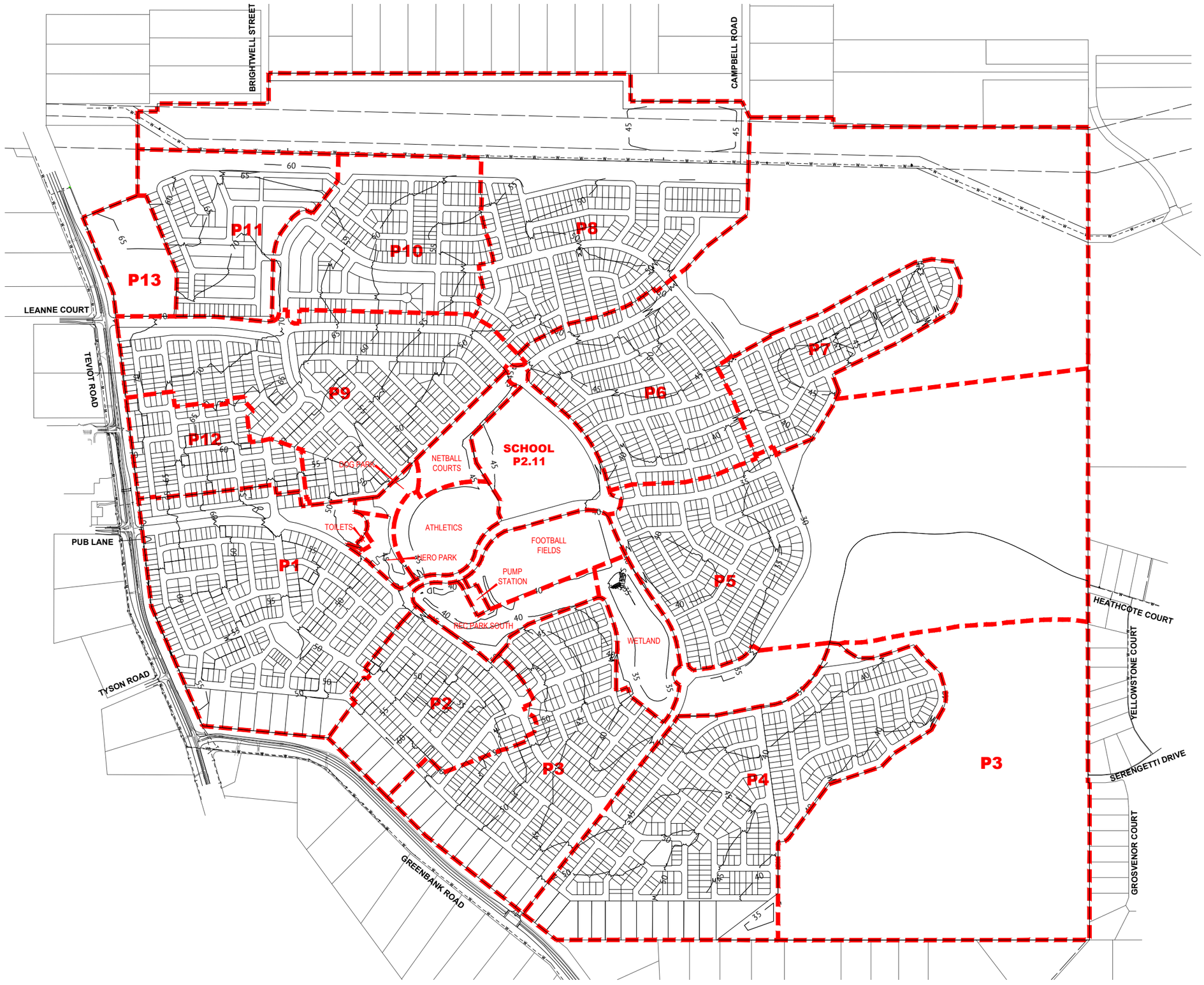
Based on the assessment work undertaken, it is recommended that Mirvac: -

1. adopt this technical report as a basis for model establishment, analysis and direction for the necessary water supply servicing requirements for the proposed Everleigh Development.
2. consult with the site engineers at the school and advise them that the site may experience marginally higher residual pressures whilst the site is supplied temporarily from the HLZ); and
3. consult with LWIA in respect to the operational risks in connection with the temporary supply arrangement to P6 as well as the limited alternative supply options available to the LLZ in the event that supply main from Greenbank Road is removed from service for whatever reason.

10. REFERENCES

1. Local Government Infrastructure Plan (LGIP), Summary of Extrinsic Material for the Water and Sewerage Networks (including Appendix 1 Desired Standards of Service for Water Supply Networks);
2. SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code), DESIGN CRITERIA.
3. SEQ Water Service Providers Water Supply Drawings;
4. Logan Water Infrastructure Alliance (LWIA), Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021
5. Logan Water Infrastructure Alliance (LWIA), Planning & Investigation Report, Logan South - Water Servicing Strategy Review Task Number: LS-018
6. MWH REPORT, Teviot Road, Greenbank Development - Water and Sewer Infrastructure Master Plan, Prepared for Mirvac, 29/5/2017
7. Water Supply Code of Australia (WSA03);
8. DNRW Planning Guidelines for Water Supply and Sewerage, 2005 (now referred to as DEWS);
9. Greater Flagstone PDA Sub-Regional Infrastructure Agreement

A.1 APPENDIX A - PROPOSED DEVELOPMENT LAYOUT AND CONTOUR PLAN



DATE	REV	DESCRIPTION	REC	APP
	A	ORIGINAL ISSUE		

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Premise

BRISBANE OFFICE
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FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222
WEB: www.premise.com.au

DESIGNED
CHECKED
PROJECT MANAGER
ENGINEERING CERTIFICATION

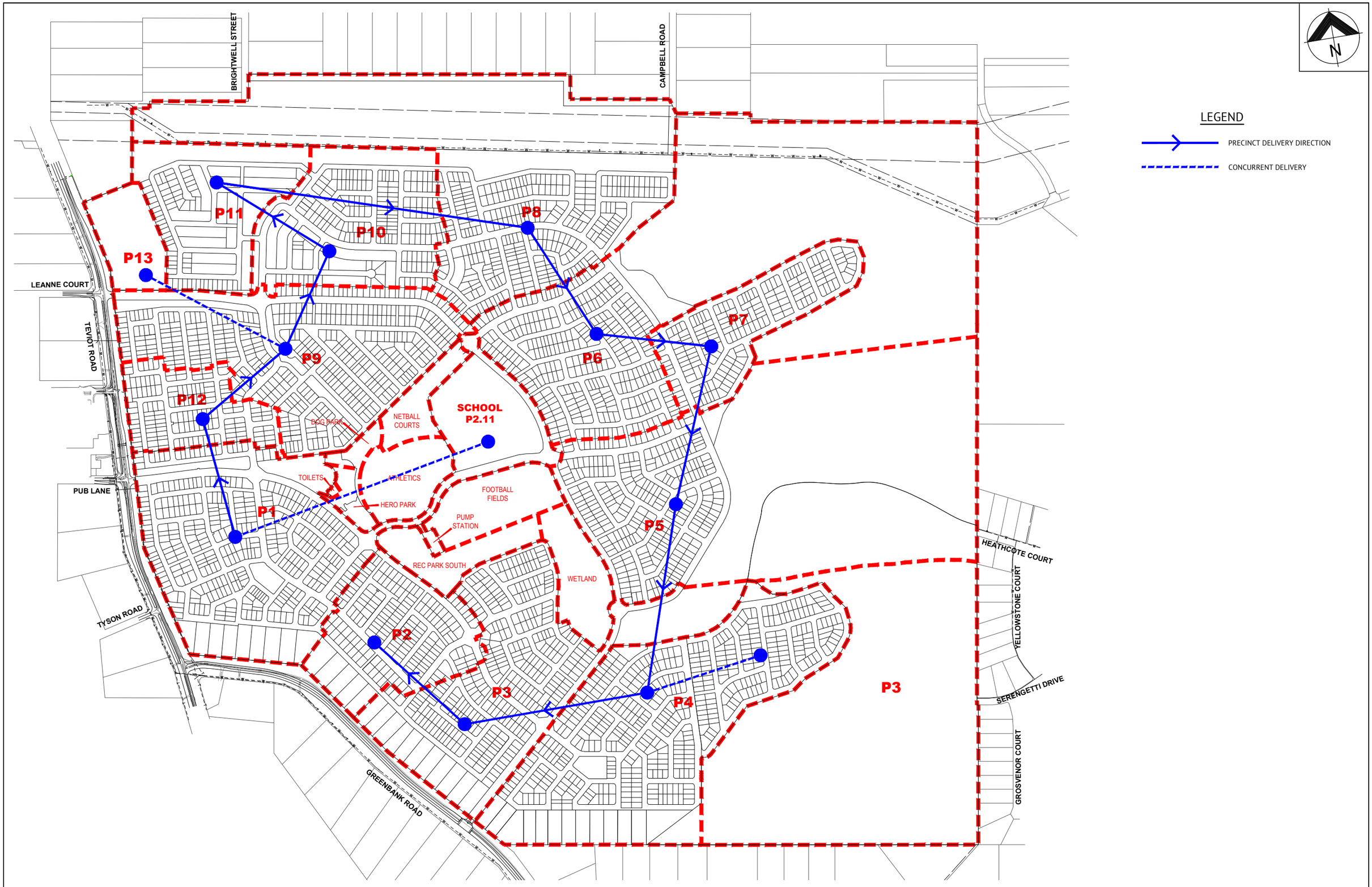
SCALE
0 100 200 300m
SCALE 1:5000 (A1)
ORIGINAL SHEET SIZE A1

CLIENT MIRVAC
PROJECT PROPOSED SUBDIVISION
LOCATION GREENBANK ROAD, GREENBANK
SHEET TITLE EVERLEIGH DEVELOPMENT LAYOUT AND CONTOUR PLAN

JOB CODE
MIRSGB

SHEET NUMBER
REV

A.2 APPENDIX B - EVERLEIGH STAGING PLAN



DATE	REV	DESCRIPTION	REC	APP
	A	ORIGINAL ISSUE		

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DESIGNED
CHECKED
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SCALE
0 100 200 300m
SCALE 1:5000 (A1)
ORIGINAL SHEET SIZE A1

CLIENT MIRVAC
PROJECT PROPOSED SUBDIVISION
LOCATION GREENBANK ROAD, GREENBANK
SHEET TITLE FY21 Q3 OPC REF PLAN - PRECINCT SEQUENCING

JOB CODE MIRSGB
SHEET NUMBER OPC004
REV A

A.3 APPENDIX C – LWIA CORRESPONDENCE (BOUNDARY CONDITION ADVICES)

Michael Majzner

From: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Sent: Friday, 5 June 2020 10:42 AM
To: Michael Majzner; tom.bradshaw@bbdengineering.com.au
Cc: WaterDA; Herath, Kumara; Ryan Llewelyn
Subject: RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Michael,

Apologies for the delayed response.

From a planning perspective I don't see any issues with the proposed layout. A second connection to the high level area was driven by the need for contingency to support a large development without storage support. This in turn add some redundancy to the low level area (pressure management concerns aside).

Further future development may also provide a secondary connection to the Munruben network.

Kind Regards

Jeremy Thomas | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**
Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |
JeremyThomas@logan.qld.gov.au
logan.qld.gov.au | facebook.com/logancitycouncil | twitter.com/logancc

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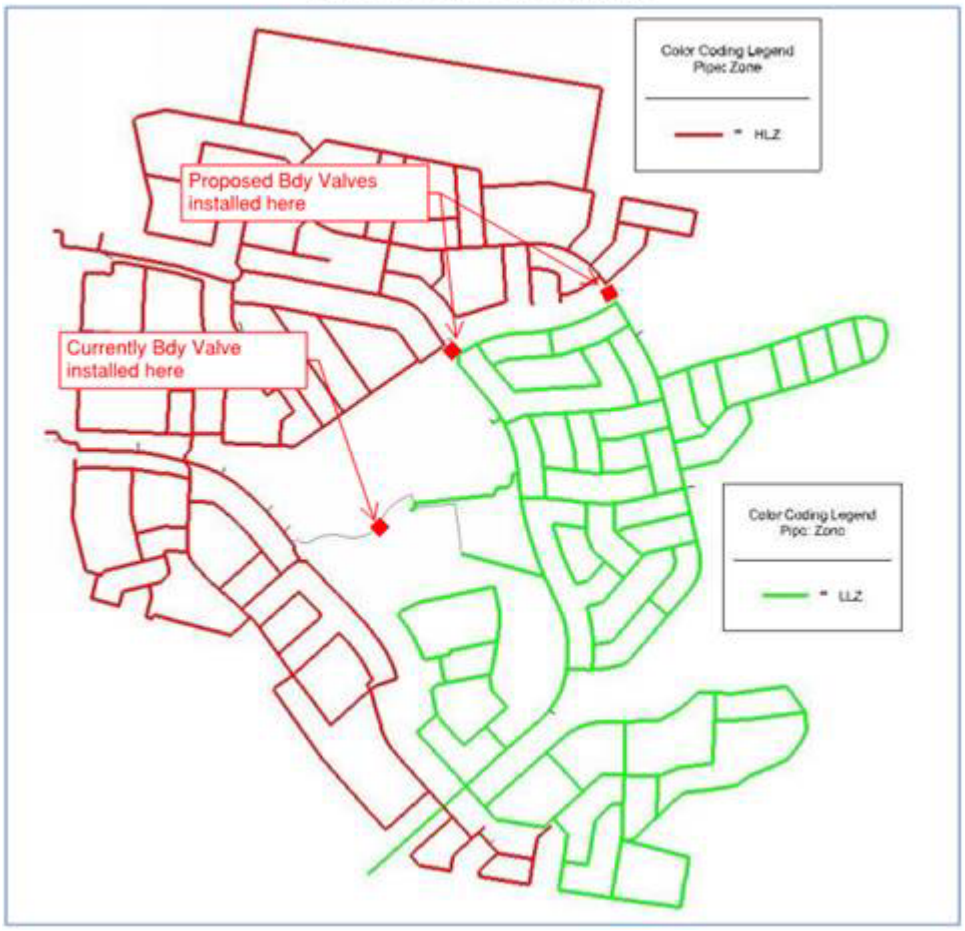
From: Michael Majzner <michael.majzner@premise.com.au>
Sent: Thursday, May 21, 2020 3:45 PM
To: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>; tom.bradshaw@bbdengineering.com.au
Cc: WaterDA <WaterDA@logan.qld.gov.au>; Herath, Kumara <KumaraHerath@logan.qld.gov.au>; Ryan Llewelyn <ryan.llewelyn@premise.com.au>
Subject: RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Jeremy,

Premise are chasing your input regarding the security of supply for the LLZ within Everleigh (circa 1500 lots).

We currently have a single connection from Greenbank Road trunk water main to service the LLZ within Everleigh. In the case of contingency conditions whereby supply is temporarily lost from the single Greenbank road connection, we have connectivity available to the HLZ (boosted Round Mountain supply) via boundary valves. We have undertaken some modelling for this scenario and depending on the initial pressures setting of the PRV, we're getting pressures up to about 80m max in the network. Mostly during off peak periods.

Figure 7.4: HLZ and LLZ Water Network



To finalise our model and reporting, we are seeking your advice on whether Logan City Council are agreeable to this above outcome?

Let me know if you have any questions on this.

Regards,

MICHAEL MAJZNER
Senior Designer

Premise

T 07 3253 2222
E michael.majzner@premise.com.au
A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006

From: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Sent: Thursday, 23 January 2020 2:12 PM
To: tom.bradshaw@bbdengineering.com.au
Cc: WaterDA <WaterDA@logan.qld.gov.au>; Herath, Kumara <KumaraHerath@logan.qld.gov.au>; Joshua Stone <joshua.stone@premise.com.au>
Subject: RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Quick addendum – given the scale of the HL zone we'd probably be looking for a second connection into the Everleigh HL zone for security of supply if feasible, I think I remember one planned in earlier proposals? Please consider this in your detailed planning.

Kind Regards

Jeremy Thomas | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**
Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |
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From: Thomas, Jeremy
Sent: Thursday, 23 January 2020 2:09 PM
To: tom.bradshaw@bbdengineering.com.au
Cc: WaterDA <WaterDA@logan.qld.gov.au>; Herath, Kumara <KumaraHerath@logan.qld.gov.au>; Joshua Stone <joshua.stone@premise.com.au>
Subject: FW: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Tom,

Please see requested boundary conditions appended below. Noting the significant increase in HL level demands from our initial estimates (which were fairly coarse based on average area densities and contour lines), I can see that the draft network layout between high and low level zones appears to be a prudent approach given the topographical and zoning constraints. The revised servicing strategy for the area can accommodate the increase based on our initial modelling review, depending on actual staging and external developments within the zone this will likely trigger a pump upgrade sooner than we have initially forecast and the scope of the upgrade will also be larger. I don't anticipate either of these factors will be a significant issue from a planning perspective.

Kind Regards

Jeremy Thomas | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**
Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |
JeremyThomas@logan.qld.gov.au
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From: Ryan, Brad <BradRyan@logan.qld.gov.au>
Sent: Thursday, 23 January 2020 1:32 PM
To: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Subject: RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Jeremy,

Boundary conditions using the connection details provided are as follows:

- **Teviot Road Trunk Main Connection - via Pub Lane pump station**
  107m head, 41m pressure, 66m elevation

- **Greenbank Road trunk main connection – via Round Mountain reservoir**
  85m head, 35m pressure, 50m elevation

The proposed distribution of demand has a larger portion on the Pub Lane pump station than current planning has allowed.

Current planning Pub Lane PS ultimate size - 45L/s @ 18m.
Proposed demand distribution Pub Lane PS size – 80 L/s @25m.

Thanks, Brad Ryan.

From: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Sent: Thursday, 23 January 2020 9:56 AM
To: Ryan, Brad <BradRyan@logan.qld.gov.au>
Subject: FW: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Ok cleared that up – Ultimate boundary conditions for the two points please

Kind Regards

Jeremy Thomas | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**
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JeremyThomas@logan.qld.gov.au
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From: Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>
Sent: Thursday, 23 January 2020 8:14 AM
To: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Cc: Joshua Stone <joshua.stone@premise.com.au>
Subject: RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Jeremy – I have revised the BC request to only request the BCs that will most likely apply to ultimate case for Everleigh and the proposed trunk main connection locations. Please see below in red, this should qualify matters.

BC Request 1 Teviot Road Trunk Main Connection (HLZ)
PH (1900 hr) – 45 Ls (Correct - See attached)
FF – 51 L/s (at 2/3 MH) (Correct - see attached)
Irrigation Demand – ~~71 L/s (4am off peak)~~. **This appears to be a new requirement and could be problematic with an anticipated off-peak supply via the Grid required to support Beaudesert planned. With drought conditions prevailing there may also be issues with this volume of potable water for irrigation purposes.** Re the irrigation flows, disregard. This BC was requested primarily as a sensitivity assessment off the trunk main. Depending on irrigation settings there maybe a requirement to increase flows for shorter period.

BC Request 2 Greenbank Road trunk main connection (LLZ)
PH – 26 L/s (correct – see attached)
~~FF - 70 L/s (at 2/3 MH)~~ **This appears high based on the above PH flow, what fire flow demand has been applied here?** Reduced to 51 L/s – see attached. Fire fighting settings in model corrected to reflect LWIA requirements.
Irrigation demand (including portion of residential) – ~~65 L/s (4am off peak)~~. Disregard – see above.

From: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Sent: Wednesday, 22 January 2020 2:29 PM
To: Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>
Cc: Herath, Kumara <KumaraHerath@logan.qld.gov.au>; WaterDA <WaterDA@logan.qld.gov.au>; Ryan, Brad <BradRyan@logan.qld.gov.au>
Subject: RE: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Tom,

Can you confirm the Planning report referenced (LS-021?). I think there probably more than a little ambiguity within the context of the supply strategy and sources. The Whole Logan South Water Supply Area is serviced by Round Mountain and large areas are boosted.

The initial and existing Everleigh connection is serviced by the Spring Mountain reservoir / Pub Lane Pump Station (ex. Round Mountain), when the current pump capacity is reached (or potentially prior to address WQ challenges) the zone will be split with Pub Lane no longer supplying Spring Mountain reservoir and transitioning into a booster

supply from Round Mountain servicing elevated areas including Everleigh (>55m). Elevation lower than 55m are anticipated to be serviced directly off Round Mountain gravity.

We'll provide updated boundary conditions based on the latest model shortly. However, can you confirm the demands indicated?

BC Request 1 Teviot Road Trunk Main Connection (HLZ)
PH (1900 hr) – 45 Ls
FF – 51 L/s (at 2/3 MH)
Irrig. Demand (including portion of residential) – 71 L/s (4am off peak)**This appears to be a new requirement and could be problematic with an anticipated off-peak supply via the Grid required to support Beaudesert planned. With drought conditions prevailing there may also be issues with this volume of potable water for irrigation purposes.**

BC Request 2 Greenbank Road trunk main connection (LLZ)
PH – 26 L/s
FF - 70 L/s (at 2/3 MH) **This appears high based on the above PH flow, what fire flow demand has been applied here?**
Irrig demand (including portion of residential) – 65 L/s (4am off peak). **As above.**

Kind Regards

Jeremy Thomas | Senior Planning Engineer-Project Manager | Water Infrastructure | **Logan City Council**
Phone: 07 3412 9667 | Mobile: 0406 803 497 | PO Box 3226 Logan City DC QLD 4114 |
JeremyThomas@logan.qld.gov.au
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From: Herath, Kumara <KumaraHerath@logan.qld.gov.au>
Sent: Monday, 20 January 2020 8:37 AM
To: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Cc: WaterDA <WaterDA@logan.qld.gov.au>
Subject: FW: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Good Morning Jeremy

Please see the e mail below from Thomas from bbd Water Engineering, he has been engaged in water planning works for Everleigh by the developer.

Can you please respond to him (cc to me as well), I also would like to request for a plan showing the service strategy for the area.

Regards

Kumara Herath| Water Development Services Engineer | Water Infrastructure Branch | **Logan City Council**
Phone: 07 3412 4728 | PO Box 3226 Logan City DC Qld 4114 | kumaraherath@logan.qld.gov.au
www.logan.qld.gov.au | facebook.com/logancitycouncil | twitter.com/logancc

From: Tom Bradshaw [mailto: tom.bradshaw@bbdengineering.com.au]
Sent: Tuesday, 14 January 2020 9:59 AM
To: WaterDA <WaterDA@logan.qld.gov.au>
Cc: Herath, Kumara <KumaraHerath@logan.qld.gov.au>; Joshua Stone <joshua.stone@premise.com.au>; Michael Majzner <michael.majzner@premise.com.au>
Subject: WDS Everleigh Mirvac CSR#2901059 REQUEST for Boundary Conditions - Everleigh Trunk Main Supply Points

Hi Kumara, Thanks very much for your time regarding Everleigh yesterday, please find below and attached our request for boundary condition assessment for Everleigh development in Greenbank. 2 BCs are required, one for the proposed HLZ and the other for the LLZ, further information and background is provided below.

In accordance with LWIAs Planning & Investigation Report outlining the Water Servicing Strategy for Greenbank and we note that LWIA are proposing to source water for the development using only Round Mountain supply (ie option 2). We understand from the report conclusions, that supply to the elevated regions will now be via boosted supply from Round Mountain supply zone whereas low lying areas will continue to be serviced via gravity supply from Round Mountain. This strategy is in contrast to the previous adopted servicing strategy for the respective areas and according we are seeking updates on boundary condition advices at the proposed connection points to existing trunk services in Teviot Road (for ELZ) and Greenbank Road (for LLZ) as per the attached diagram. Trust attached is legible. If not, please give me a call to clarify.

Without going into too much details in regards to background demands, the attached is a representation of the likely max demands for the development in both the immediate instance and long term planning scenario. All demands include the relevant portion of irrigation, PH and fire (commercial based for school and rec parks).

BC Request 1 Teviot Road Trunk Main Connection (HLZ)
PH (1900 hr) – 45 Ls
FF – 51 L/s (at 2/3 MH)
Irrig. Demand (including portion of residential) – 71 L/s (4am off peak)

BC Request 2 Greenbank Road trunk main connection (LLZ)
PH – 26 L/s
FF - 70 L/s (at 2/3 MH)
Irrig demand (including portion of residential) – 65 L/s (4am off peak)

Let me know if you require further clarification.

Kind Regards

Thomas Bradshaw
Principal Water and Utilities Engineer, North Queensland
BE Hons, CPEng, RPEQ, NER, MIEAust

bbd water engineering

M: 0407 139 238 **E:** tom.bradshaw@bbdengineering.com.au

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A.4 APPENDIX D – LWIA, LCC WDS, & EDQ CONFIRMATION OF MODELLING PARAMETERS

Michael Majzner

From: Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>
Sent: Friday, 20 March 2020 6:35 AM
To: Joshua Stone
Cc: Clint Thorp; Mark Clancy (mark.clancy@mirvac.com); jason.augustine@mirvac.com; Michael Majzner; Tom Bradshaw; Thomas, Jeremy; KumaraHerath@logan.qld.gov.au; WaterDA
Subject: RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Follow Up Flag: Follow up
Flag Status: Completed

Hi Josh,

EDQ agrees with the assumptions, parameters and limitations for the updated water network model as identified below.

Cheers,

Marco Bonotto
Principal Engineer – Technical Services
Economic Development Queensland
Department of State Development,
Manufacturing, Infrastructure and Planning

Queensland Government

P 07 3452 7696 | **E** marco.bonotto@dsdmip.qld.gov.au
Level 14, 1 William Street, Brisbane QLD 4000
GPO Box 2202, Brisbane QLD 4001
www.dsdmip.qld.gov.au

From: Joshua Stone <joshua.stone@premise.com.au>
Sent: Thursday, 19 March 2020 3:15 PM
To: Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>
Cc: Clint Thorp <clint.thorp@premise.com.au>; Mark Clancy (mark.clancy@mirvac.com) <mark.clancy@mirvac.com>; jason.augustine@mirvac.com; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>; Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>; KumaraHerath@logan.qld.gov.au; WaterDA <WaterDA@logan.qld.gov.au>
Subject: RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Thanks Marco.

Please refer attached email correspondence confirming that LWIA and LCC WDS are in agreeance with the below modelling parameters and modelling assumptions.

Can you please now provide EDQ endorsement via return email that we may now proceed with the finalisation of our WOS water model for Everleigh.

JOSHUA STONE
Senior Project Manager

Premise

T 07 3253 2222 **| M** 0408 063 479
E joshua.stone@premise.com.au
A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006

From: Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>
Sent: Tuesday, 17 March 2020 8:45 AM
To: Joshua Stone <joshua.stone@premise.com.au>
Cc: Clint Thorp <clint.thorp@premise.com.au>; Mark Clancy (mark.clancy@mirvac.com) <mark.clancy@mirvac.com>
Subject: RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Josh,

Considering the extensive consultation that has already been occurred between yourself and Logan Water in this regard, I recommend you are liaising directly with them in relation to the acceptance assumptions, parameters and limitations for the water network model you are working at.

Please let me know if you have any issue with that.

Cheers,

Queensland Government

Marco Bonotto
Principal Engineer – Technical Services
Economic Development Queensland
Department of State Development,
Manufacturing, Infrastructure and Planning

P 07 3452 7696 | **E** marco.bonotto@dsdmip.qld.gov.au
Level 14, 1 William Street, Brisbane QLD 4000
GPO Box 2202, Brisbane QLD 4001
www.dsdmip.qld.gov.au

From: Joshua Stone <joshua.stone@premise.com.au>
Sent: Monday, 16 March 2020 10:11 AM
To: KumaraHerath@logan.qld.gov.au; Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>; Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Cc: Mark Clancy (mark.clancy@mirvac.com) <mark.clancy@mirvac.com>; jason.augustine@mirvac.com; Clint Thorp <clint.thorp@premise.com.au>; Madeleine Hartley-Davis <madeleine.hartleydavis@premise.com.au>; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>
Subject: RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Kumara / Jeremy / Marco,

Just following up on my below communication.

We were hoping to have a response from yourselves by last Friday. Are you able to come back to me with when we can expect your response as we are keen to avoid any program delays.

Thanks gents. Look forward to hearing from you.

JOSHUA STONE
Senior Project Manager

Premise

T 07 3253 2222 **| M** 0408 063 479
E joshua.stone@premise.com.au
A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006

From: Joshua Stone <joshua.stone@premise.com.au>
Sent: Thursday, 5 March 2020 11:56 AM
To: KumaraHerath@logan.qld.gov.au; Jeremy Thomas <jeremy.thomas@loganwia.com.au>; Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>
Cc: Mark Clancy (mark.clancy@mirvac.com) <mark.clancy@mirvac.com>; jason.augustine@mirvac.com; Clint Thorp <clint.thorp@premise.com.au>; Madeleine Hartley-Davis <madeleine.hartleydavis@premise.com.au>; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>
Subject: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Kumara / Jeremy / Marco,

Hope you have all been well.

As you are aware, we are working on the whole of site water network modelling update for the Everleigh project.

We have listed out below all of the modelling parameters, assumptions and limitations adopted for the purposes of this modelling update and require your written confirmation by Friday the 13th March to avoid program delays (email response back to me is fine) that you have reviewed the below and are accepting of these:

1. The network model was established and assessed using Bentley WaterCAD Connect Series 2 software using the Extended time series analysis functionality over three (3) consecutive maximum days (MD). It is noted for the purposes of providing our modelling files to LCC / LWIA for their review, we will be providing this output directly from Bentley WaterCAD.
2. The network model was developed and assessed accordance with the requirements of (in order of precedence):
    - Greater Flagstone PDA Sub-Regional Infrastructure Agreement;
    - LCC's / LWIA's Desired Standards of Service (DSS);
    - SEQ Design & Construction Code
3. The external servicing strategy for Everleigh is based on Option #2 outlined in LWIA's Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021 (Revision E.1 dated 05/07/2018), stating that elevated regions will be serviced via a pressure boosted supply from Round Mountain and that non-elevated areas will be supplied via gravity from Round Mountain.
4. Confirming that as per the correspondence received from LWIA (refer attached email dated 23/01/2020) we will be providing a second connection into the estate off the Teviot Road trunk main into the HLZ. This is currently planned to occur at the intersection of Leanne Court / Teviot Road / Anderson Drive.

5. It is assumed that the existing pressure management device (PRV) installed on Everleigh Drive which connects to the 300mm dia Teviot Road trunk main (i.e. to manage pressures within Precinct 1) will remain as the primary point of supply to the Elevated Zone (ELZ) until such time as the future stages are brought online in alignment with the current planned development roll out. It is anticipated that an additional PRV will be required off the second connection into the HLZ at the intersection of Leanne Court / Teviot Road / Anderson Drive.
6. The whole of site modelling has assumed that all currently designed / constructed water mains in Precinct 1, Ivory Parkway and the School Site will remain as proposed and will not be changing – i.e. these are fixed points in the model.
7. Boundary Conditions (BC's) were modelled as fixed Hydraulic Grade (HGL) values for the elevated and non-elevated pressure zones within the network (refer LWIA correspondence attached and listed below for your reference). Please refer attached email received from LWIA dated 23/01/2020 outlining the agreed boundary conditions to be adopted. These have also been summarised below for clarity:
    - Teviot Road Trunk Main Connection - via Pub Lane pump station
        - 107m head, 41m pressure, 66m elevation
    - Greenbank Road trunk main connection – via Round Mountain reservoir
        - 85m head, 35m pressure, 50m elevation
8. It has been assumed that the BC's are generally representative of the lowest possible HGL value likely to be experienced at the external connection points during peak hour demand periods.
9. Is has been assumed that the elevated pressure zone is defined as all land situated above RL50. This was confirmed with LWIA (refer attached correspondence dated 24/01/2020).
10. The boundary between pressure zones will be designated within the Bentley WaterCAD model via the absence of a pipe link.
11. The model for Precinct 1 within the Bentley WaterCAD model was established based on As Constructed / design plans.
12. The model for future precincts was established based on the internal road network, allotment layout plans and latest master planning advice provided by Mirvac.
13. Nodal elevations were based on the most recent whole of site bulk earthworks modelling carried out by Premise.
14. The following friction factors were adopted for the internal reticulation mains within the model:

Pipe Size	HW C Factor
< = 150	110
150 to <= 300	120
>300 < = 600	130

15. The following use conversion factors (EP/unit), as provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement, has been adopted in the network modelling.

SCHEDULE 3

DEMAND LIMIT – USE CONVERSION FACTORS

USES			CONVERSION FACTORS
Residential uses	Pre 1 January 2016	detached dwelling	2.91EP/dwelling
		attached dwelling	1.83EP/dwelling
	On or after 1 January 2016	detached dwelling	2.8EP/dwelling
		attached dwelling	1.78EP/dwelling
Retail uses (excluding showrooms)			30EP/ha
Showrooms			30EP/ha
Commercial uses			30EP/ha
Industrial uses			30EP/ha
Service, community and other uses (excluding child care centre and educational establishment)			30EP/ha
Child care centre			0.25EP/pupil and staff
Educational establishment	Primary school		0.1EP/pupil and staff
	Secondary school		0.1EP/pupil and staff
	Any other educational establishment		0.1EP/pupil and staff
Sport, recreation and entertainment uses			30EP/ha
Tourism uses			30EP/ha
Rural uses			30EP/ha
Mixed use (being a development combining residential uses and any other use)			The conversion factor for the Residential uses and, if the mixed use includes a Child care centre or Educational establishment, the conversion factor for the Child care centre and Educational establishment (as applicable) (as set out above) plus 15EP/ha
Any other uses			30EP/ha

In this Schedule 3, conversion factors per hectare (ha) are to be calculated using the area of the registered lot(s).

16. The network model has been produced based on a development layout that has a density which is considered as the projected upper limit for the site. Adopting the upper limit provides flexibility within the model for protentional future planning layout alterations. The adopted densities are listed in the below summarised land uses and overall EP calculations table:

USES	Dwellings	Residential EP	Non-Residential EP	Total EP
Residential use - detached dwelling	3,159	8,845	-	8,845
Residential use - attached dwelling	674	1,199	-	1,199
Retail uses (excluding showrooms)	-	-	102	102
Showrooms	-	-	-	-
Commercial uses	-	-	-	-
Industrial uses	-	-	-	-
Service, community and other uses	-	-	96	96
Child care centre	-	-	-	-
Educational establishment	-	-	368*	368*

Sport, recreation and entertainment uses	-	-	-	-
Tourism uses	-	-	-	-
Rural uses	-	-	-	-
Mixed use	-	-	-	-
Any other uses	-	-	-	-
Total	**3,833**	**10,045**	**566**	**10,610**

* rmined that the nominated Greater Flagstone PDA Sub-Regional Infrastructure Agreement value for the school site was too low and hence this higher EP value has been adopted (1.05 EP/Ha).

17. Demands were factored by a MD/AD ratio of 1.7 for residential areas and 1.3 for non-residential areas.
18. Separate diurnal demand patterns were applied to the model for residential areas and commercial regions with maximum hour (MH) peaking factors of 1.83 (for residential areas) and 1.54 (for commercial areas).
19. Non-essential demands (e.g. irrigation) were applied during off peak periods (e.g. midnight through 4am).
20. External water storage upgrades were not assessed. It is assumed that LWIA will examine the requirement for upgrading existing storage reserves to support all approved future development within the region and that is not part of this assessment.
21. Minimum pressure and related performance requirements for onsite irrigation appliances were not assessed. In instances whereby an onsite irrigation system requires a minimum pressure and/ or performance requirement over and above what can be provided by the Water Authority (which is what has been allowed for in our modelling), it is assumed that the respective property owner will design their own onsite infrastructure to ensure adequate service is able to be provided.
22. In respect to firefighting, AS2419 may necessitate the need for fire hydrant coverage for the likes of a commercial development with a performance capability different (or potentially more onerous) to that required by LCC's / LWIA's Desired Standards of Service (DSS). In the event that an individual property (e.g. School) requires fire hydrant coverage and performance over and above the performance that LWIA can provide and the whole of site water model has allowed for, the property or lease owner will need to assess and design their own onsite infrastructure to service such firefighting requirements in line with the relevant Australian Standard/s. Design firefighting requirements set down within AS2419 and related Australian Standards have not been assessed nor considered herein this report.
23. It is assumed that all risks associated with the external servicing strategy (including provision for alternative supply) for the broader Greenbank area rests with the Water Authority and have not been considered in our whole of site water modelling.

Thanks Kumara / Jeremy / Marco – please do not hesitate to contact me if you have any questions.

Following your confirmation to the above, we will then be able to finalise our revised whole of site modelling and associated reporting and issue to all parties.

Look forward to hearing from you all.

Premise

JOSHUA STONE
Senior Project Manager

T 07 3253 2222 **| M** 0408 063 479
E joshua.stone@premise.com.au
A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006

Michael Majzner

From: Herath, Kumara <KumaraHerath@logan.qld.gov.au>
Sent: Thursday, 19 March 2020 2:46 PM
To: Joshua Stone
Cc: WaterDA
Subject: RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Josh

WDS is happy with Jeremy's comments and recommendations as mentioned below.

Regards

Kumara Herath| Water Development Services Engineer | Water Infrastructure Branch | **Logan City Council**
Phone: 07 3412 4728 | PO Box 3226 Logan City DC Qld 4114 | kumaraherath@logan.qld.gov.au
www.logan.qld.gov.au | facebook.com/logancitycouncil | twitter.com/logancc

Logan City: Building our Communities, our Business and our Pride

---

From: Joshua Stone [mailto:joshua.stone@premise.com.au]
Sent: Thursday, 19 March 2020 1:17 PM
To: Herath, Kumara <KumaraHerath@logan.qld.gov.au>
Cc: WaterDA <WaterDA@logan.qld.gov.au>; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>
Subject: RE: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Thanks Kumara,

The below from Jeremy looks positive and that he is in agreeance with our modelling parameters.

Can I ask that you now also provide your endorsement of the parameters based on Jeremy's acceptance to allow our WOS modelling to be finalised.

Thanks Kumara. Look forward to hearing from you.

Premise

JOSHUA STONE
Senior Project Manager

T 07 3253 2222 **| M** 0408 063 479
E joshua.stone@premise.com.au
A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006

From: Herath, Kumara <KumaraHerath@logan.qld.gov.au>
Sent: Thursday, 19 March 2020 12:07 PM
To: Joshua Stone <joshua.stone@premise.com.au>
Cc: WaterDA <WaterDA@logan.qld.gov.au>
Subject: FW: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Josh

Please see the response from Jeremy Thomas to your enquiry

Regards

Kumara Herath| Water Development Services Engineer | Water Infrastructure Branch | **Logan City Council**
Phone: 07 3412 4728 | PO Box 3226 Logan City DC Qld 4114 | kumaraherath@logan.qld.gov.au
www.logan.qld.gov.au | facebook.com/logancitycouncil | twitter.com/logancc

Logan City: Building our Communities, our Business and our Pride

From: Joshua Stone <joshua.stone@premise.com.au>
Sent: Thursday, 5 March 2020 11:59 AM
To: Thomas, Jeremy <JeremyThomas@logan.qld.gov.au>
Cc: Madeleine Hartley-Davis <madeleine.hartleydavis@premise.com.au>; Michael Majzner <michael.majzner@premise.com.au>
Subject: FW: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Jeremy,

Got a bounce back from your other email address – am sending this to you again.

Premise

JOSHUA STONE
Senior Project Manager

T 07 3253 2222 **| M** 0408 063 479
E joshua.stone@premise.com.au
A Level 1, 100 Brunswick St, Fortitude Valley QLD 4006

From: Joshua Stone <joshua.stone@premise.com.au>
Sent: Thursday, 5 March 2020 11:56 AM
To: KumaraHerath@logan.qld.gov.au; Jeremy Thomas <jeremy.thomas@loganwia.com.au>; Marco Bonotto <Marco.Bonotto@dsdmip.qld.gov.au>
Cc: Mark Clancy (mark.clancy@mirvac.com) <mark.clancy@mirvac.com>; jason.augustine@mirvac.com; Clint Thorp

<clint.thorp@premise.com.au>; Madeleine Hartley-Davis <madeleine.hartleydavis@premise.com.au>; Michael Majzner <michael.majzner@premise.com.au>; Tom Bradshaw <tom.bradshaw@bbdengineering.com.au>
Subject: Everleigh - Whole Of Site - Updated Water Network Modelling Assumptions For Confirmation

Hi Kumara / Jeremy / Marco,

Hope you have all been well.

As you are aware, we are working on the whole of site water network modelling update for the Everleigh project.

We have listed out below all of the modelling parameters, assumptions and limitations adopted for the purposes of this modelling update and require your written confirmation by Friday the 13th March to avoid program delays (email response back to me is fine) that you have reviewed the below and are accepting of these:

1. The network model was established and assessed using Bentley WaterCAD Connect Series 2 software using the Extended time series analysis functionality over three (3) consecutive maximum days (MD). It is noted for the purposes of providing our modelling files to LCC / LWIA for their review, we will be providing this output directly from Bentley WaterCAD. **Noted. No issue -WaterCAD can export EPANet format which can be imported into InfoWATER**
2. The network model was developed and assessed accordance with the requirements of (in order of precedence): **Noted, and agree with hierarchy.**
    - Greater Flagstone PDA Sub-Regional Infrastructure Agreement;
    - LCC's / LWIA's Desired Standards of Service (DSS);
    - SEQ Design & Construction Code
3. The external servicing strategy for Everleigh is based on Option #2 outlined in LWIA's Planning & Investigation Report, Greenbank Water Servicing Strategy Task Number: LS-021 (Revision E.1 dated 05/07/2018), stating that elevated regions will be serviced via a pressure boosted supply from Round Mountain and that non-elevated areas will be supplied via gravity from Round Mountain. **Agreed**.
4. Confirming that as per the correspondence received from LWIA (refer attached email dated 23/01/2020) we will be providing a second connection into the estate off the Teviot Road trunk main into the HLZ. This is currently planned to occur at the intersection of Leanne Court / Teviot Road / Anderson Drive. **Agreed**
5. It is assumed that the existing pressure management device (PRV) installed on Everleigh Drive which connects to the 300mm dia Teviot Road trunk main (i.e. to manage pressures within Precinct 1) will remain as the primary point of supply to the Elevated Zone (ELZ) until such time as the future stages are brought online in alignment with the current planned development roll out. It is anticipated that an additional PRV will be required off the second connection into the HLZ at the intersection of Leanne Court / Teviot Road / Anderson Drive. **Agreed**
6. The whole of site modelling has assumed that all currently designed / constructed water mains in Precinct 1, Ivory Parkway and the School Site will remain as proposed and will not be changing – i.e. these are fixed points in the model. **Agreed**
7. Boundary Conditions (BC's) were modelled as fixed Hydraulic Grade (HGL) values for the elevated and non-elevated pressure zones within the network (refer LWIA correspondence attached and listed below for your reference). Please refer attached email received from LWIA dated 23/01/2020 outlining the agreed boundary conditions to be adopted. These have also been summarised below for clarity:
    - Teviot Road Trunk Main Connection - via Pub Lane pump station
        - 107m head, 41m pressure, 66m elevation
    - Greenbank Road trunk main connection – via Round Mountain reservoir
        - 85m head, 35m pressure, 50m elevation

    While we have noted a lower head available in the latest model for the elevated area with the updated strategy, however, this would be resolved by a pump upgrade to maintain the BC's previously agreed to. We will need the final model to assess the likely timing of the pump upgrade (likely to be brought forward).
8. It has been assumed that the BC's are generally representative of the lowest possible HGL value likely to be experienced at the external connection points during peak hour demand periods. **That is correct.**
9. Is has been assumed that the elevated pressure zone is defined as all land situated above RL50. This was confirmed with LWIA (refer attached correspondence dated 24/01/2020). **That is correct. There may be**

some 'wiggle room' for a small number of properties should the modelling output satisfactorily demonstrate that DSS can be exceeded with reasonable allowances for unknowns/losses.

10. The boundary between pressure zones will be designated within the Bentley WaterCAD model via the absence of a pipe link. **Noted**
11. The model for Precinct 1 within the Bentley WaterCAD model was established based on As Constructed / design plans. **Noted**
12. The model for future precincts was established based on the internal road network, allotment layout plans and latest master planning advice provided by Mirvac. **Noted**
13. Nodal elevations were based on the most recent whole of site bulk earthworks modelling carried out by Premise. **Noted**
14. The following friction factors were adopted for the internal reticulation mains within the model:

Pipe Size	HW C Factor
< = 150	110
150 to <= 300	120
>300 < = 600	130

Noted and acceptable. We find that Colebrook White provides a better outcome as the above coefficients are conservative, however unlikely to impact significantly on reticulation mains.

15. The following use conversion factors (EP/unit), as provided in the Greater Flagstone PDA Sub-Regional Infrastructure Agreement, has been adopted in the network modelling. **Noted**

SCHEDULE 3

DEMAND LIMIT – USE CONVERSION FACTORS

USES			CONVERSION FACTORS
Residential uses	Pre 1 January 2016	detached dwelling	2.91EP/dwelling
		attached dwelling	1.83EP/dwelling
	On or after 1 January 2016	detached dwelling	2.8EP/dwelling
		attached dwelling	1.78EP/dwelling
Retail uses (excluding showrooms)			30EP/ha
Showrooms			30EP/ha
Commercial uses			30EP/ha
Industrial uses			30EP/ha
Service, community and other uses (excluding child care centre and educational establishment)			30EP/ha
Child care centre			0.25EP/pupil and staff
Educational establishment	Primary school		0.1EP/pupil and staff
	Secondary school		0.1EP/pupil and staff
	Any other educational establishment		0.1EP/pupil and staff
Sport, recreation and entertainment uses			30EP/ha
Tourism uses			30EP/ha
Rural uses			30EP/ha
Mixed use (being a development combining residential uses and any other use)			The conversion factor for the Residential uses and, if the mixed use includes a Child care centre or Educational establishment, the conversion factor for the Child care centre and Educational establishment (as applicable) (as set out above) plus 15EP/ha
Any other uses			30EP/ha

In this Schedule 3, conversion factors per hectare (ha) are to be calculated using the area of the registered lot(s).

16. The network model has been produced based on a development layout that has a density which is considered as the projected upper limit for the site. Adopting the upper limit provides flexibility within the model for protentional future planning layout alterations. The adopted densities are listed in the below summarised land uses and overall EP calculations table:

USES	Dwellings	Residential EP	Non-Residential EP	Total EP
Residential use - detached dwelling	3,159	8,845	-	8,845
Residential use - attached dwelling	674	1,199	-	1,199
Retail uses (excluding showrooms)	-	-	102	102
Showrooms	-	-	-	-
Commercial uses	-	-	-	-
Industrial uses	-	-	-	-
Service, community and other uses	-	-	96	96
Child care centre	-	-	-	-
Educational establishment	-	-	368*	368*

Sport, recreation and entertainment uses	-	-	-	-
Tourism uses	-	-	-	-
Rural uses	-	-	-	-
Mixed use	-	-	-	-
Any other uses	-	-	-	-
Total	**3,833**	**10,045**	**566**	**10,610**

* rmined that the nominated Greater Flagstone PDA Sub-Regional Infrastructure Agreement value for the school site was too low and hence this higher EP value has been adopted (1.05 EP/Ha). **Noted**

17. Demands were factored by a MD/AD ratio of 1.7 for residential areas and 1.3 for non-residential areas. **Noted**
18. Separate diurnal demand patterns were applied to the model for residential areas and commercial regions with maximum hour (MH) peaking factors of 1.83 (for residential areas) and 1.54 (for commercial areas). **Noted**
19. Non-essential demands (e.g. irrigation) were applied during off peak periods (e.g. midnight through 4am). **Noted**
20. External water storage upgrades were not assessed. It is assumed that LWIA will examine the requirement for upgrading existing storage reserves to support all approved future development within the region and that is not part of this assessment. **Agreed**.
21. Minimum pressure and related performance requirements for onsite irrigation appliances were not assessed. In instances whereby an onsite irrigation system requires a minimum pressure and/ or performance requirement over and above what can be provided by the Water Authority (which is what has been allowed for in our modelling), it is assumed that the respective property owner will design their own onsite infrastructure to ensure adequate service is able to be provided. **Agreed (subject to approvals for such uses by Council)**
22. In respect to firefighting, AS2419 may necessitate the need for fire hydrant coverage for the likes of a commercial development with a performance capability different (or potentially more onerous) to that required by LCC's / LWIA's Desired Standards of Service (DSS). In the event that an individual property (e.g. School) requires fire hydrant coverage and performance over and above the performance that LWIA can provide and the whole of site water model has allowed for, the property or lease owner will need to assess and design their own onsite infrastructure to service such firefighting requirements in line with the relevant Australian Standard/s. Design firefighting requirements set down within AS2419 and related Australian Standards have not been assessed nor considered herein this report. **Agreed.**
23. It is assumed that all risks associated with the external servicing strategy (including provision for alternative supply) for the broader Greenbank area rests with the Water Authority and have not been considered in our whole of site water modelling. **Agreed**

Thanks Kumara / Jeremy / Marco – please do not hesitate to contact me if you have any questions.

Following your confirmation to the above, we will then be able to finalise our revised whole of site modelling and associated reporting and issue to all parties.

Look forward to hearing from you all.

Premise

JOSHUA STONE
Senior Project Manager

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A.5 APPENDIX E – MODEL RESULTS

WATER LEGEND

- 63Ø mPVC WATER MAIN
- 100Ø mPVC WATER MAIN
- 150Ø mPVC WATER MAIN
- 200Ø mPVC WATER MAIN
- 250Ø mPVC WATER MAIN

LEGEND

COMPLETED WORKS

Length Calculation

Layer Name	Length
P01 WATER_100	x
P01 WATER_150	x
P01 WATER_200	x
P01 WATER_250	x
P02 WATER_100	1962.678
P02 WATER_150	475.151
P02 WATER_250	30.361
P03 WATER_100	3509.652
P03 WATER_150	329.765
P03 WATER_250	866.761
P04 WATER_100	6269.514
P04 WATER_150	312.353
P05 WATER_100	2992.891
P05 WATER_150	89.674
P05 WATER_200	111.229
P05 WATER_250	311.119
P06 WATER_100	3377.365
P06 WATER_150	16.082
P07 WATER_100	2843.032
P08 WATER_100	5165.811
P08 WATER_150	98.637
P09 WATER_100	4561.528
P09 WATER_150	163.187
P09 WATER_200	385.886
P09 WATER_250	484.238
P10 WATER_100	2477.230
P10 WATER_150	615.990
P10 WATER_200	126.487
P11 WATER_100	2118.758
P11 WATER_150	187.685
P12 WATER_63	x
P12 WATER_100	x
P12 WATER_150	x
P12 WATER_200	x
ATHLETICS WATER_100	24.093
ATHLETICS WATER_150	35.729
DOG PARK WATER_150	94.762
FOOTBALL FIELDS WATER_150	4.425
FOOTBALL FIELDS WATER_200	77.372
HERO PARK WATER_150	137.844
NETBALL COURTS WATER_100	75.593
NETBALL COURTS WATER_150	109.021
WETLAND WATER_200	11.758
P2.11 WATER_100	x
P2.11 WATER_150	x
P2.11 WATER_200	x
WATER_EX	6778.820

*REFER DETAILED PROJECT SCHEDULE QUANTITIES

DMA METER ARRANGEMENT

DMA METER ARRANGEMENTS (AND PRESSURE MANAGEMENT) ARE REQUIRED AT ALL CONNECTIONS TO THE EXTERNAL TRUNK MAINS UNLESS OTHERWISE INDICATED BY COUNCIL

WATERMAIN SIZING NOTE:

WATER MAIN SIZES SHOWN ON THIS DRAWING ARE IN ACCORDANCE WITH THE HYDRAULIC WATER MODELLING REPORT PREPARED BY PREMISE, DATED SEPTEMBER 2020

DATE	REV	DESCRIPTION	APPROVED
28/09/20	F	ADDED WATERMAIN LINK TO P4 AND NOTES AS REQUESTED BY EDQ	
07/08/20	E	AMENDED ALIGNMENTS AND LENGTHS AS PER CHANGES TO LOT CALCS AND WATER NETWORK REPORT	
24/04/20	D	UPDATED WATER MAIN SIZE TO REFLECT LATEST WATER MODEL	
15/02/19	C	UPDATED IN ACCORDANCE WITH DIVISION OF PSF	
12/12/18	B	UPDATED IN ACCORDANCE WITH WHOLE OF SITE INVESTIGATIONS	
	A	ORIGINAL ISSUE	

REVISIONS

Premise

BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222
WEB: www.premise.com.au

DESIGNED MM
DRAWN MM
CHECKED DATE
DATE MAY 2017

APPROVED DATE
KEITH HOWELLS RPEQ 7295
SCALE 0 100 200 300m
SCALE 1:5000 (A1)

CLIENT
MIRVAC

PROJECT PROPOSED SUBDIVISION
LOCATION GREENBANK ROAD, GREENBANK
SHEET TITLE SERVICING LAYOUT - WATER RETICULATION LAYOUT

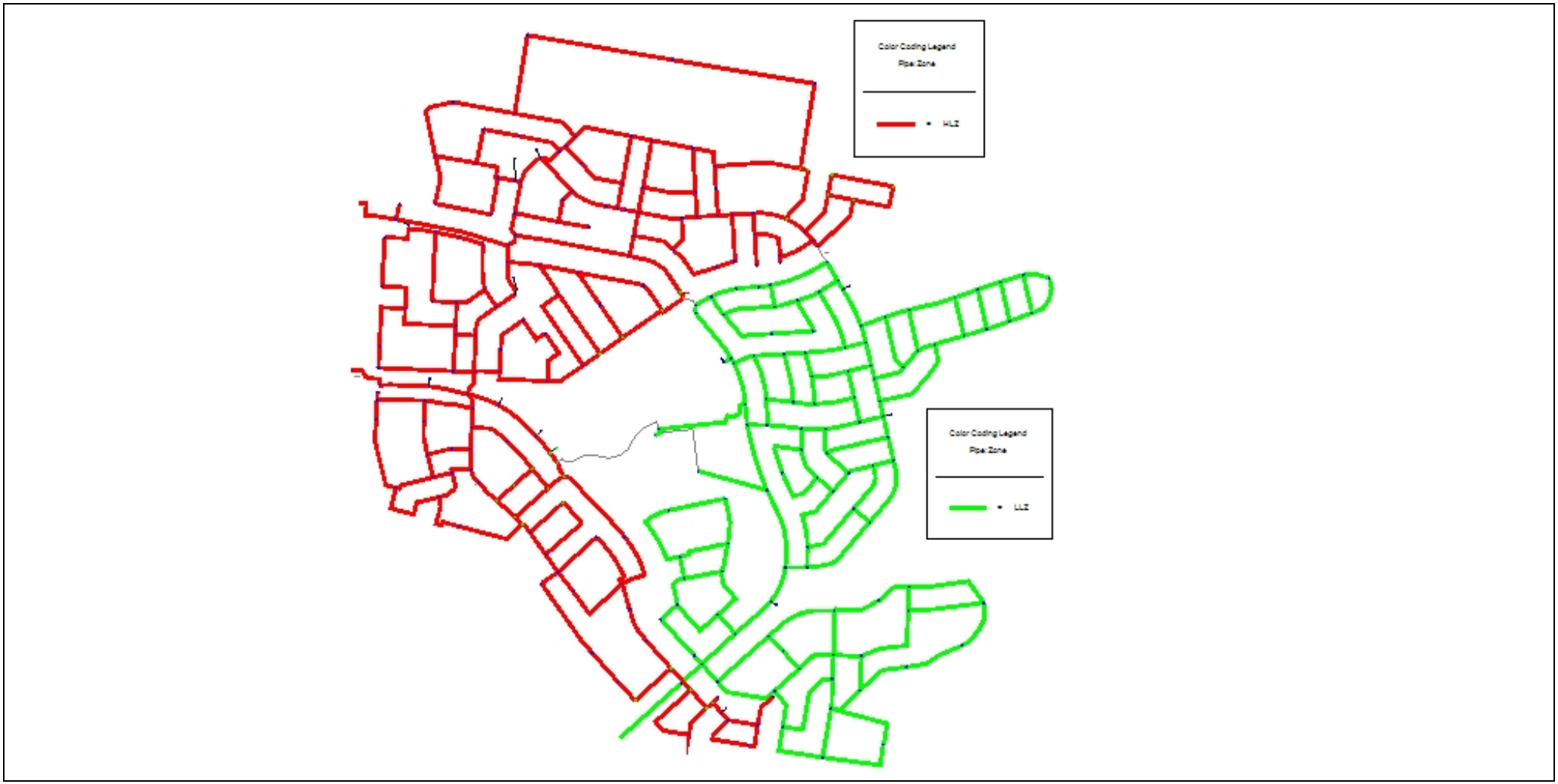
JOB CODE: MIRSGB
SHEET NUMBER: SL100
REV: F

FORM E027 10 AUG 2006

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

LLZ and HLZ Extents - Time: 19.00 hours



Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
B-002	45.0	2	0.434	<Collection: 2 items>	103.9	58.8
B-003	48.5	0	0.000	<Collection: 0 items>	103.9	55.3
B-004	48.5	0	0.000	<Collection: 0 items>	103.9	55.3
B-005	51.0	0	0.000	<Collection: 0 items>	103.9	52.8
B-006	50.5	2	0.246	<Collection: 2 items>	103.9	53.2
B-007	49.5	0	0.000	<Collection: 0 items>	103.9	54.2
B-008	50.0	0	0.000	<Collection: 0 items>	103.9	53.7
B-009	53.0	2	0.359	<Collection: 2 items>	103.9	50.8
B-010	49.0	0	0.000	<Collection: 0 items>	103.9	54.8
B-011	50.5	2	0.321	<Collection: 2 items>	103.9	53.2
B-012	44.0	2	0.227	<Collection: 2 items>	103.9	59.8
B-013	49.0	2	0.302	<Collection: 2 items>	104.0	54.8
B-014	46.5	2	0.284	<Collection: 2 items>	103.9	57.3
B-014a	48.9	2	0.528	<Collection: 2 items>	103.9	54.9
B-015	52.5	2	0.472	<Collection: 2 items>	103.9	51.3
B-016	55.0	2	0.227	<Collection: 2 items>	104.0	48.9
B-016a	52.2	2	0.510	<Collection: 2 items>	104.0	51.7
B-017	60.0	2	0.510	<Collection: 2 items>	104.0	43.9
B-018	58.0	2	0.264	<Collection: 2 items>	104.0	45.9
B-018a	60.7	2	0.321	<Collection: 2 items>	104.0	43.2
B-019	51.0	2	0.585	<Collection: 2 items>	104.0	52.9
B-021	51.5	2	0.246	<Collection: 2 items>	104.2	52.6
B-022	49.0	0	0.000	<Collection: 0 items>	104.2	55.1
B-023	47.0	2	0.434	<Collection: 2 items>	104.2	57.1
B-023a	48.7	0	0.000	<Collection: 0 items>	104.2	55.4
B-023b	48.8	2	0.340	<Collection: 2 items>	104.3	55.3
B-024	45.5	2	0.434	<Collection: 2 items>	104.2	58.5
B-025	46.0	2	0.528	<Collection: 2 items>	104.3	58.2
B-025a	48.9	0	0.000	<Collection: 0 items>	104.3	55.2
B-026	45.0	0	0.000	<Collection: 0 items>	104.3	59.2
B-027	50.5	2	0.548	<Collection: 2 items>	104.2	53.6
B-028	53.5	0	0.000	<Collection: 0 items>	104.2	50.6
B-028a	55.7	2	0.264	<Collection: 2 items>	104.3	48.5
B-029	54.0	0	0.000	<Collection: 0 items>	104.2	50.1

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
B-030	52.0	2	0.472	<Collection: 2 items>	104.2	52.1
B-030a	50.7	2	0.113	<Collection: 2 items>	104.2	53.4
B-031	54.5	0	0.000	<Collection: 0 items>	104.2	49.6
B-031a	56.8	2	1.208	<Collection: 2 items>	104.2	47.4
B-031b	56.2	0	0.000	<Collection: 0 items>	104.3	48.0
B-032	56.0	2	0.359	<Collection: 2 items>	104.2	48.1
B-033	48.0	0	0.000	<Collection: 0 items>	104.3	56.2
B-034	52.0	0	0.000	<Collection: 0 items>	104.3	52.2
B-035	54.0	0	0.000	<Collection: 0 items>	104.3	50.2
B-036	58.0	0	0.000	<Collection: 0 items>	104.3	46.2
B-036a	53.3	2	0.246	<Collection: 2 items>	104.3	50.9
B-037	56.0	2	0.510	<Collection: 2 items>	104.3	48.2
B-038	62.0	2	0.453	<Collection: 2 items>	104.3	42.2
B-038a	60.0	0	0.000	<Collection: 0 items>	104.2	44.1
B-039	63.0	2	0.264	<Collection: 2 items>	104.2	41.2
B-039a	61.6	2	0.661	<Collection: 2 items>	104.2	42.5
B-040	66.0	0	0.000	<Collection: 0 items>	104.2	38.2
B-041	55.0	0	0.000	<Collection: 0 items>	104.4	49.3
B-042	61.0	0	0.000	<Collection: 0 items>	104.4	43.3
B-043	54.0	0	0.000	<Collection: 0 items>	104.5	50.4
B-044	56.0	0	0.000	<Collection: 0 items>	104.5	48.4
B-045	66.0	2	0.434	<Collection: 2 items>	104.5	38.4
B-045a	66.1	2	0.416	<Collection: 2 items>	104.5	38.3
B-046	57.5	2	0.302	<Collection: 2 items>	104.6	47.0
B-047	58.0	2	0.396	<Collection: 2 items>	104.6	46.5
B-048	60.0	0	0.000	<Collection: 0 items>	104.6	44.5
B-049	66.5	2	0.680	<Collection: 2 items>	104.5	37.9
B-049a	70.0	2	0.472	<Collection: 2 items>	104.5	34.4
B-050	63.0	2	0.453	<Collection: 2 items>	104.6	41.5
B-051	62.5	2	0.396	<Collection: 2 items>	104.7	42.2
B-052	66.0	2	0.227	<Collection: 2 items>	104.7	38.6
B-053	72.6	2	0.548	<Collection: 2 items>	104.5	31.9
B-054	71.0	2	0.227	<Collection: 2 items>	104.5	33.4
B-055	52.0	0	0.000	<Collection: 0 items>	104.5	52.4

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
B-055a	54.5	2	0.340	<Collection: 2 items>	104.5	49.9
B-055b	59.0	2	0.246	<Collection: 2 items>	104.5	45.4
B-056	49.5	2	0.246	<Collection: 2 items>	104.5	54.9
B-057	55.0	2	0.416	<Collection: 2 items>	104.5	49.4
B-058	50.5	2	0.227	<Collection: 2 items>	104.7	54.1
B-058a	48.0	2	0.302	<Collection: 2 items>	104.8	56.6
B-059	56.0	2	0.585	<Collection: 2 items>	104.8	48.7
B-060	66.5	0	0.000	<Collection: 0 items>	105.1	38.6
B-061	62.0	2	0.321	<Collection: 2 items>	105.0	43.0
B-062	46.5	2	0.264	<Collection: 2 items>	104.8	58.2
B-063	52.0	0	0.000	<Collection: 0 items>	104.8	52.7
B-064	57.0	2	0.623	<Collection: 2 items>	104.8	47.7
B-064a	49.8	2	0.606	<Collection: 2 items>	104.8	54.9
B-065	46.5	0	0.000	<Collection: 0 items>	104.8	58.2
B-066	44.5	0	0.000	<Collection: 0 items>	104.8	60.2
B-077	62.0	0	0.000	<Collection: 0 items>	104.9	42.8
B-079	66.0	0	0.000	<Collection: 0 items>	104.4	38.3
B-080	73.0	2	0.264	<Collection: 2 items>	104.6	31.5
B-081	64.0	2	0.340	<Collection: 2 items>	104.6	40.5
B-082	70.0	2	0.246	<Collection: 2 items>	104.6	34.5
I-02	50.5	0	0.000	<Collection: 0 items>	104.3	53.7
I-04	51.5	0	0.000	<Collection: 0 items>	104.3	52.7
I-05	48.0	0	0.000	<Collection: 0 items>	104.3	56.2
S-001	70.0	2	0.378	<Collection: 2 items>	105.3	35.2
S-002	56.0	2	0.737	<Collection: 2 items>	104.7	48.6
S-003	46.0	2	0.378	<Collection: 2 items>	104.7	58.5
S-004	69.0	0	0.000	<Collection: 0 items>	105.2	36.1
S-004a	60.0	2	0.151	<Collection: 2 items>	104.9	44.8
S-005	69.0	2	0.510	<Collection: 2 items>	105.1	36.0
S-006	67.5	0	0.000	<Collection: 0 items>	104.9	37.3
S-007	66.0	0	0.000	<Collection: 0 items>	104.8	38.7
S-008	65.5	0	0.000	<Collection: 0 items>	104.7	39.2
S-008a	62.6	2	0.264	<Collection: 2 items>	104.7	42.0
S-009	64.0	2	0.321	<Collection: 2 items>	104.7	40.6

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
S-010	61.5	2	0.434	<Collection: 2 items>	104.6	43.1
S-011	60.0	2	0.491	<Collection: 2 items>	104.6	44.5
S-012	57.0	2	0.227	<Collection: 2 items>	104.6	47.5
S-013	53.0	2	0.302	<Collection: 2 items>	104.5	51.4
S-014	72.0	2	0.302	<Collection: 2 items>	105.0	32.9
S-015	73.0	4	0.491	<Collection: 4 items>	105.0	31.9
S-016	73.0	2	0.707	<Collection: 2 items>	104.9	31.8
S-017	65.0	2	0.396	<Collection: 2 items>	104.8	39.8
S-018	62.5	2	0.302	<Collection: 2 items>	104.8	42.2
S-019	65.0	2	0.132	<Collection: 2 items>	104.7	39.6
S-020	71.0	0	0.000	<Collection: 0 items>	104.9	33.8
S-021	59.0	2	0.189	<Collection: 2 items>	104.7	45.6
S-022	56.5	0	0.000	<Collection: 0 items>	104.7	48.1
S-023	56.5	0	0.000	<Collection: 0 items>	104.7	48.1
S-024	56.0	2	0.302	<Collection: 2 items>	104.6	48.5
S-025	53.5	0	0.000	<Collection: 0 items>	104.6	51.0
S-026	53.0	0	0.000	<Collection: 0 items>	104.6	51.5
S-027	52.5	2	0.189	<Collection: 2 items>	104.5	51.9
S-027a	52.8	2	0.453	<Collection: 2 items>	104.5	51.6
S-028	51.0	0	0.000	<Collection: 0 items>	104.5	53.4
S-029	50.0	2	0.340	<Collection: 2 items>	104.4	54.3
S-030	49.0	0	0.000	<Collection: 0 items>	104.4	55.3
S-031	49.5	0	0.000	<Collection: 0 items>	104.4	54.8
S-032	50.0	0	0.000	<Collection: 0 items>	104.4	54.3
S-033	50.0	2	0.548	<Collection: 2 items>	104.4	54.3
S-034	56.5	2	0.340	<Collection: 2 items>	104.7	48.1
S-035	54.0	2	0.378	<Collection: 2 items>	104.6	50.5
S-036	51.0	2	0.416	<Collection: 2 items>	104.6	53.5
S-037	46.5	0	0.000	<Collection: 0 items>	104.5	57.9
S-038	46.5	2	0.528	<Collection: 2 items>	104.5	57.8
S-039	45.0	0	0.000	<Collection: 0 items>	104.4	59.3
S-040	48.0	2	0.416	<Collection: 2 items>	104.4	56.3
S-041	47.0	0	0.000	<Collection: 0 items>	104.4	57.3
S-042	58.0	2	0.246	<Collection: 2 items>	104.6	46.5

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
S-043	53.0	2	0.302	<Collection: 2 items>	104.6	51.5
S-044	50.0	2	0.396	<Collection: 2 items>	104.5	54.4
S-044a	53.0	2	0.416	<Collection: 2 items>	104.5	51.4
S-045	51.0	2	0.378	<Collection: 2 items>	104.4	53.3
S-046	53.0	0	0.000	<Collection: 0 items>	104.4	51.3
S-047	51.5	2	0.396	<Collection: 2 items>	104.4	52.8
S-048	51.0	0	0.000	<Collection: 0 items>	104.4	53.3
S-049	56.0	0	0.000	<Collection: 0 items>	104.7	48.6
S-051	52.5	0	0.000	<Collection: 0 items>	104.5	51.9
S-052	66.5	0	0.000	<Collection: 0 items>	104.8	38.2
S-053	72.0	0	0.000	<Collection: 0 items>	105.1	33.0
S-054	46.5	2	0.302	<Collection: 2 items>	104.4	57.8
S-055	71.0	2	0.000	<Collection: 2 items>	106.5	35.4
S-100	70.1	0	0.000	<Collection: 0 items>	105.3	35.1
S-105	62.0	0	0.000	<Collection: 0 items>	104.9	42.8
S-110	63.0	2	1.624	<Collection: 2 items>	104.8	41.7
S-115	64.0	0	0.000	<Collection: 0 items>	104.8	40.7
S-120	66.0	2	1.321	<Collection: 2 items>	104.8	38.7
S-NEIGHBOURHOOD CENTRE	68.5	2	0.493	<Collection: 2 items>	106.5	37.9
T-1001	46.7	0	0.000	<Collection: 0 items>	104.3	57.5

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
96	P148 HLZ	76	B-043	B-041	200.0	PVC	120.0	13.484	0.429	1.314	HLZ
364	P149 HLZ	102	S-006	S-005	150.0	PVC	110.0	-6.435	0.364	1.592	HLZ
370	P150 HLZ	180	S-015	S-016	100.0	PVC	110.0	1.384	0.176	0.666	HLZ
379	P151 HLZ	72	S-006	S-007	100.0	PVC	110.0	2.406	0.306	1.855	HLZ
384	P152 HLZ	118	S-014	S-015	150.0	PVC	110.0	1.875	0.106	0.162	HLZ
386	P153 HLZ	105	S-014	S-020	100.0	PVC	110.0	1.974	0.251	1.286	HLZ
388	P154 HLZ	155	S-016	S-017	100.0	PVC	110.0	0.677	0.086	0.177	HLZ
390	P155 HLZ	134	S-020	S-017	100.0	PVC	110.0	0.790	0.101	0.236	HLZ
395	P156 HLZ	236	S-017	S-018	100.0	PVC	110.0	1.071	0.136	0.414	HLZ
402	P157 HLZ	66	S-027	S-026	100.0	PVC	110.0	-1.763	0.224	1.043	HLZ
406	P158 HLZ	191	S-009	S-010	100.0	PVC	110.0	0.956	0.122	0.336	HLZ
413	P159 HLZ	24	S-007	S-008	100.0	PVC	110.0	2.268	0.289	1.663	HLZ
414	P160 HLZ	43	S-008	S-009	100.0	PVC	110.0	1.284	0.163	0.580	HLZ
416	P161 HLZ	151	S-010	S-034	100.0	PVC	110.0	-0.756	0.096	0.217	HLZ
417	P162 HLZ	80	S-034	S-022	100.0	PVC	110.0	-0.375	0.048	0.059	HLZ
420	P163 HLZ	66	S-010	S-011	100.0	PVC	110.0	1.278	0.163	0.575	HLZ
421	P164 HLZ	131	S-011	S-012	100.0	PVC	110.0	0.859	0.109	0.276	HLZ
427	P165 HLZ	151	S-011	S-035	100.0	PVC	110.0	-0.073	0.009	0.003	HLZ
428	P166 HLZ	80	S-035	S-024	100.0	PVC	110.0	-1.032	0.131	0.387	HLZ
430	P167 HLZ	137	S-012	S-036	100.0	PVC	110.0	-0.508	0.065	0.104	HLZ
431	P168 HLZ	79	S-036	S-026	100.0	PVC	110.0	-0.342	0.044	0.050	HLZ
432	P169 HLZ	167	S-035	S-036	100.0	PVC	110.0	0.582	0.074	0.134	HLZ
434	P170 HLZ	100	S-005	S-004	200.0	PVC	120.0	-11.095	0.353	0.916	HLZ
435	P171 HLZ	75	S-004	S-001	200.0	PVC	120.0	-13.391	0.426	1.297	HLZ
437	P172 HLZ	38	S-022	S-021	150.0	PVC	110.0	-4.361	0.247	0.775	HLZ
441	P173 HLZ	40	S-024	S-023	150.0	PVC	110.0	-3.986	0.226	0.656	HLZ
442	P174 HLZ	27	S-023	S-022	150.0	PVC	110.0	-3.986	0.226	0.656	HLZ
445	P175 HLZ	44	S-028	S-027	100.0	PVC	110.0	-1.332	0.170	0.621	HLZ
448	P176 HLZ	49	S-026	S-025	150.0	PVC	110.0	-2.105	0.119	0.201	HLZ
449	P177 HLZ	138	S-025	S-024	150.0	PVC	110.0	-2.544	0.144	0.286	HLZ
453	P178 HLZ	113	S-025	S-043	100.0	PVC	110.0	0.440	0.056	0.080	HLZ
456	P179 HLZ	66	S-029	S-028	100.0	PVC	110.0	-1.638	0.209	0.911	HLZ
458	P180 HLZ	65	S-029	S-045	100.0	PVC	110.0	0.951	0.121	0.332	HLZ
460	P181 HLZ	99	S-045	S-046	100.0	PVC	110.0	0.000	0.000	0.000	HLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
467	P182 HLZ	23	S-033	S-032	100.0	PVC	110.0	-0.762	0.097	0.221	HLZ
471	P183 HLZ	39	S-032	S-031	100.0	PVC	110.0	-0.586	0.075	0.136	HLZ
475	P184 HLZ	69	S-031	S-030	100.0	PVC	110.0	-1.089	0.139	0.428	HLZ
476	P185 HLZ	109	S-030	S-029	100.0	PVC	110.0	-0.348	0.044	0.052	HLZ
478	P186 HLZ	175	S-030	S-038	100.0	PVC	110.0	-0.741	0.094	0.210	HLZ
480	P187 HLZ	111	S-012	S-013	100.0	PVC	110.0	1.140	0.145	0.466	HLZ
486	P188 HLZ	366	S-001	S-002	100.0	PVC	110.0	2.233	0.284	1.616	HLZ
488	P189 HLZ	65	S-042	S-002	100.0	PVC	110.0	-1.119	0.142	0.449	HLZ
490	P190 HLZ	207	S-002	S-003	100.0	PVC	110.0	0.378	0.048	0.060	HLZ
491	P191 HLZ	20	S-003	B-066	100.0	PVC	110.0	0.000	0.000	0.000	HLZ
495	P192 HLZ	133	S-045	S-047	100.0	PVC	110.0	0.573	0.073	0.130	HLZ
496	P193 HLZ	118	S-047	S-032	100.0	PVC	110.0	0.177	0.022	0.015	HLZ
498	P194 HLZ	22	S-047	S-048	100.0	PVC	110.0	0.000	0.000	0.000	HLZ
500	P195 HLZ	176	S-043	S-044	100.0	PVC	110.0	1.118	0.142	0.449	HLZ
507	P196 HLZ	198	S-018	S-019	100.0	PVC	110.0	0.769	0.098	0.224	HLZ
508	P197 HLZ	214	S-019	S-009	100.0	PVC	110.0	-0.006	0.001	0.000	HLZ
510	P198 HLZ	250	S-019	S-049	100.0	PVC	110.0	0.643	0.082	0.161	HLZ
512	P199 HLZ	465	S-049	S-050	100.0	PVC	110.0	0.643	0.082	0.161	HLZ
514	P200 HLZ	453	S-050	S-051	100.0	PVC	110.0	0.643	0.082	0.161	HLZ
516	P201 HLZ	25	S-038	S-037	100.0	PVC	110.0	-1.270	0.162	0.568	HLZ
517	P202 HLZ	273	S-037	S-013	100.0	PVC	110.0	-0.627	0.080	0.154	HLZ
518	P203 HLZ	272	S-051	S-037	100.0	PVC	110.0	0.643	0.082	0.161	HLZ
521	P204 HLZ	141	S-031	S-054	100.0	PVC	110.0	0.503	0.064	0.102	HLZ
523	P205 HLZ	64	S-054	S-039	100.0	PVC	110.0	0.187	0.024	0.016	HLZ
524	P206 HLZ	197	S-039	S-040	100.0	PVC	110.0	0.187	0.024	0.016	HLZ
526	P207 HLZ	192	S-033	S-041	100.0	PVC	110.0	0.215	0.027	0.021	HLZ
527	P208 HLZ	180	S-041	S-040	100.0	PVC	110.0	0.229	0.029	0.024	HLZ
528	P209 HLZ	82	S-054	S-041	100.0	PVC	110.0	0.014	0.002	0.000	HLZ
531	P210 HLZ	109	S-052	S-020	100.0	PVC	110.0	-1.184	0.151	0.499	HLZ
546	P211 HLZ	76	B-002	B-003	100.0	PVC	110.0	0.614	0.078	0.148	HLZ
548	P212 HLZ	268	B-002	B-009	100.0	PVC	110.0	0.312	0.040	0.042	HLZ
549	P213 HLZ	110	B-009	B-003	100.0	PVC	110.0	-0.047	0.006	0.001	HLZ
553	P214 HLZ	25	B-003	B-004	100.0	PVC	110.0	0.567	0.072	0.127	HLZ
554	P215 HLZ	23	B-004	B-010	100.0	PVC	110.0	0.000	0.000	0.000	HLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
558	P216 HLZ	94	B-006	B-007	100.0	PVC	110.0	0.163	0.021	0.013	HLZ
560	P217 HLZ	89	B-007	B-011	100.0	PVC	110.0	0.163	0.021	0.013	HLZ
561	P218 HLZ	193	B-011	B-006	100.0	PVC	110.0	-0.158	0.020	0.012	HLZ
563	P219 HLZ	108	B-007	B-008	100.0	PVC	110.0	0.000	0.000	0.000	HLZ
568	P220 HLZ	152	B-012	B-014	100.0	PVC	110.0	0.476	0.061	0.092	HLZ
572	P221 HLZ	117	B-012	B-013	150.0	PVC	110.0	-2.063	0.117	0.194	HLZ
577	P222 HLZ	227	B-017	B-016	100.0	PVC	110.0	-0.078	0.010	0.003	HLZ
580	P223 HLZ	187	B-016	B-019	100.0	PVC	110.0	0.218	0.028	0.022	HLZ
583	P224 HLZ	78	B-018	B-017	100.0	PVC	110.0	0.432	0.055	0.077	HLZ
584	P225 HLZ	164	B-019	B-018	100.0	PVC	110.0	-0.367	0.047	0.057	HLZ
590	P226 HLZ	141	B-024	B-021	100.0	PVC	110.0	-1.048	0.133	0.398	HLZ
592	P227 HLZ	62	B-026	B-025	150.0	PVC	110.0	3.545	0.201	0.528	HLZ
593	P228 HLZ	138	B-025	B-023	150.0	PVC	110.0	1.959	0.111	0.176	HLZ
601	P229 HLZ	31	B-023	B-022	150.0	PVC	110.0	2.606	0.147	0.298	HLZ
602	P230 HLZ	36	B-022	B-021	150.0	PVC	110.0	3.080	0.174	0.407	HLZ
616	P231 HLZ	111	B-030	B-029	150.0	PVC	110.0	-0.782	0.044	0.032	HLZ
618	P232 HLZ	62	B-031	B-029	150.0	PVC	110.0	-0.329	0.019	0.006	HLZ
619	P233 HLZ	73	B-029	B-028	150.0	PVC	110.0	-1.111	0.063	0.062	HLZ
623	P234 HLZ	52	B-041	B-037	150.0	PVC	110.0	5.937	0.336	1.372	HLZ
624	P235 HLZ	60	B-037	B-036	150.0	PVC	110.0	2.978	0.169	0.382	HLZ
625	P236 HLZ	153	B-038	B-037	150.0	PVC	110.0	-2.449	0.139	0.266	HLZ
627	P237 HLZ	251	B-030	B-032	150.0	PVC	110.0	-0.278	0.016	0.005	HLZ
631	P238 HLZ	150	B-039	B-038	150.0	PVC	110.0	-1.036	0.059	0.054	HLZ
634	P239 HLZ	66	B-043	B-044	150.0	PVC	110.0	-1.123	0.064	0.063	HLZ
636	P240 HLZ	236	B-044	B-045	150.0	PVC	110.0	0.417	0.024	0.010	HLZ
640	P241 HLZ	210	B-049	B-048	100.0	PVC	110.0	-1.025	0.130	0.382	HLZ
642	P242 HLZ	27	B-048	B-047	100.0	PVC	110.0	-0.258	0.033	0.030	HLZ
643	P243 HLZ	116	B-047	B-044	100.0	PVC	110.0	1.540	0.196	0.812	HLZ
646	P244 HLZ	115	B-046	B-043	200.0	PVC	120.0	11.492	0.366	0.977	HLZ
647	P245 HLZ	63	B-047	B-046	150.0	PVC	110.0	-2.194	0.124	0.217	HLZ
649	P246 HLZ	74	B-048	B-050	100.0	PVC	110.0	-0.767	0.098	0.223	HLZ
651	P247 HLZ	101	B-050	B-052	100.0	PVC	110.0	-1.980	0.252	1.293	HLZ
657	P248 HLZ	189	B-054	B-053	100.0	PVC	110.0	-0.787	0.100	0.234	HLZ
660	P249 HLZ	121	B-051	B-046	200.0	PVC	120.0	13.989	0.445	1.406	HLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
661	P250 HLZ	66	B-052	B-051	150.0	PVC	110.0	-3.632	0.206	0.552	HLZ
668	P251 HLZ	123	B-064	B-061	100.0	PVC	110.0	-2.251	0.287	1.640	HLZ
673	P252 HLZ	126	B-062	B-063	100.0	PVC	110.0	-0.800	0.102	0.242	HLZ
674	P253 HLZ	122	B-063	B-064	100.0	PVC	110.0	-0.800	0.102	0.242	HLZ
679	P254 HLZ	292	B-059	B-058	100.0	PVC	110.0	1.001	0.127	0.366	HLZ
683	P255 HLZ	101	B-061	B-060	150.0	PVC	110.0	-5.043	0.285	1.014	HLZ
685	P256 LLZ	111	B-059	B-061	100.0	PVC	110.0	-2.471	0.315	1.950	HLZ
692	P257 LLZ	129	B-058	B-056	100.0	PVC	110.0	2.115	0.269	1.461	HLZ
693	P258 HLZ	175	B-056	B-055	100.0	PVC	110.0	0.995	0.127	0.362	HLZ
694	P259 HLZ	182	B-057	B-056	100.0	PVC	110.0	-0.874	0.111	0.285	HLZ
698	P260 HLZ	151	B-062	B-065	100.0	PVC	110.0	-0.222	0.028	0.022	HLZ
701	P261 HLZ	86	B-065	B-066	100.0	PVC	110.0	0.000	0.000	0.000	HLZ
734	P262 HLZ	125	B-042	B-041	250.0	PVC	120.0	0.000	0.000	0.000	HLZ
738	P263 HLZ	103	B-041	B-035	250.0	PVC	120.0	7.547	0.154	0.151	HLZ
743	P264 HLZ	27	B-039	B-040	150.0	PVC	110.0	0.000	0.000	0.000	HLZ
744	P265 HLZ	128	B-031	B-032	150.0	PVC	110.0	0.527	0.030	0.015	HLZ
745	P266 HLZ	81	B-043	B-055	150.0	PVC	110.0	-0.868	0.049	0.039	HLZ
747	P267 HLZ	154	B-035	B-034	250.0	PVC	120.0	7.547	0.154	0.151	HLZ
752	P268 HLZ	69	B-034	B-033	250.0	PVC	120.0	7.547	0.154	0.151	HLZ
758	P269 HLZ	48	B-028	B-027	150.0	PVC	110.0	0.360	0.020	0.008	HLZ
763	P270 HLZ	42	B-004	B-005	100.0	PVC	110.0	0.567	0.072	0.127	HLZ
764	P271 HLZ	32	B-005	B-006	100.0	PVC	110.0	0.567	0.072	0.127	HLZ
770	P272 HLZ	18	S-005	S-053	150.0	PVC	110.0	4.151	0.235	0.707	HLZ
771	P273 HLZ	56	S-053	S-014	150.0	PVC	110.0	4.151	0.235	0.707	HLZ
778	P274 HLZ	212	B-016	B-020	150.0	PVC	110.0	-3.397	0.192	0.488	HLZ
779	P275 HLZ	272	B-020	B-026	150.0	PVC	110.0	-4.002	0.226	0.661	HLZ
783	P276 HLZ	49	S-055	S-NEIGHBOURHOOD CENTRE	200.0	PVC	120.0	0.493	0.016	0.003	HLZ
789	P277 HLZ	70	B-051	B-077	200.0	PVC	120.0	-18.017	0.573	2.247	HLZ
790	P278 HLZ	107	B-077	B-060	200.0	PVC	120.0	-18.017	0.573	2.247	HLZ
825	P279 HLZ	86	PRV-2	Teviot Rd Connection 1	250.0	PVC	120.0	0.000	0.000	0.000	HLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
834	P280 HLZ	156	B-042	B-079	250.0	PVC	120.0	0.000	0.000	0.000	HLZ
835	P281 HLZ	35	B-079	PRV-2	250.0	PVC	120.0	0.000	0.000	0.000	HLZ
841	P282 HLZ	79	B-080	B-053	100.0	PVC	110.0	0.915	0.117	0.310	HLZ
848	P283 HLZ	217	B-053	B-081	100.0	PVC	110.0	-0.420	0.053	0.073	HLZ
849	P284 HLZ	77	B-081	B-050	100.0	PVC	110.0	-0.759	0.097	0.219	HLZ
851	P285 HLZ	144	B-052	B-082	100.0	PVC	110.0	1.425	0.181	0.704	HLZ
852	P286 HLZ	77	B-082	B-080	100.0	PVC	110.0	1.180	0.150	0.496	HLZ
961	P287 HLZ	61	S-044	S-044a	100.0	PVC	110.0	0.722	0.092	0.200	HLZ
962	P288 HLZ	148	S-044a	S-028	100.0	PVC	110.0	0.306	0.039	0.041	HLZ
976	P289 HLZ	136	S-042	S-043	100.0	PVC	110.0	0.981	0.125	0.352	HLZ
978	P290 HLZ	88	B-062	B-058a	100.0	PVC	110.0	0.758	0.096	0.218	HLZ
979	P291 HLZ	64	B-058a	B-058	100.0	PVC	110.0	1.341	0.171	0.628	HLZ
980	P292 HLZ	227	B-059	B-058a	100.0	PVC	110.0	0.885	0.113	0.291	HLZ
983	P293 HLZ	108	B-055b	B-057	100.0	PVC	110.0	-0.459	0.058	0.086	HLZ
985	P294 HLZ	270	B-015	B-018a	100.0	PVC	110.0	-0.808	0.103	0.246	HLZ
987	P295 HLZ	64	B-018	B-018a	100.0	PVC	110.0	1.129	0.144	0.457	HLZ
991	P296 HLZ	92	B-012	B-002	100.0	PVC	110.0	1.360	0.173	0.645	HLZ
1024	P297 HLZ	39	B-033	T-1001	250.0	PVC	120.0	7.547	0.154	0.151	HLZ
1025	P298 HLZ	50	T-1001	B-026	250.0	PVC	120.0	7.547	0.154	0.151	HLZ
1042	P299 HLZ	85	B-021	B-021a	100.0	PVC	110.0	1.787	0.227	1.070	HLZ
1043	P300 HLZ	68	B-021a	B-018	100.0	PVC	110.0	2.193	0.279	1.563	HLZ
1044	P301 HLZ	236	B-024	B-021a	100.0	PVC	110.0	0.613	0.078	0.148	HLZ
1046	P302 HLZ	97	B-065	B-064a	100.0	PVC	110.0	-0.222	0.028	0.023	HLZ
1047	P303 HLZ	212	B-064a	B-064	100.0	PVC	110.0	-0.828	0.105	0.257	HLZ
1052	P304 HLZ	72	S-013	S-027a	100.0	PVC	110.0	0.211	0.027	0.021	HLZ
1053	P305 HLZ	84	S-027a	S-027	100.0	PVC	110.0	-0.242	0.031	0.026	HLZ
1055	P306 HLZ	73	S-008	S-008a	100.0	PVC	110.0	0.985	0.125	0.355	HLZ
1056	P307 HLZ	153	S-008a	S-034	100.0	PVC	110.0	0.720	0.092	0.199	HLZ
1058	P308 HLZ	127	B-036	B-036a	150.0	PVC	110.0	0.796	0.045	0.033	HLZ
1061	P309 HLZ	245	B-032	B-039a	150.0	PVC	110.0	-0.111	0.006	0.001	HLZ
1062	P310 HLZ	59	B-039a	B-039	150.0	PVC	110.0	-0.772	0.044	0.031	HLZ
1065	P311 HLZ	64	B-038a	B-038	150.0	PVC	110.0	-0.960	0.054	0.047	HLZ
1067	P312 HLZ	74	B-031	B-031a	150.0	PVC	110.0	-0.198	0.011	0.003	HLZ
1068	P313 HLZ	107	B-031a	B-038a	150.0	PVC	110.0	-0.960	0.054	0.047	HLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
1070	P314 HLZ	68	B-036	B-028a	150.0	PVC	110.0	2.182	0.123	0.215	HLZ
1071	P315 HLZ	64	B-028a	B-028	150.0	PVC	110.0	1.471	0.083	0.104	HLZ
1074	P316 HLZ	79	B-031a	B-031b	100.0	PVC	110.0	-0.446	0.057	0.082	HLZ
1075	P317 HLZ	60	B-031b	B-028a	100.0	PVC	110.0	-0.446	0.057	0.082	HLZ
1077	P318 HLZ	222	B-022	B-030a	150.0	PVC	110.0	-0.475	0.027	0.013	HLZ
1078	P319 HLZ	171	B-030a	B-030	150.0	PVC	110.0	-0.588	0.033	0.019	HLZ
1080	P320 HLZ	117	B-036a	B-025a	150.0	PVC	110.0	0.551	0.031	0.017	HLZ
1081	P321 HLZ	79	B-025a	B-025	150.0	PVC	110.0	-1.058	0.060	0.056	HLZ
1083	P322 HLZ	82	B-027	B-023a	150.0	PVC	110.0	-0.188	0.011	0.002	HLZ
1084	P323 HLZ	79	B-023a	B-023	150.0	PVC	110.0	1.081	0.061	0.058	HLZ
1087	P324 HLZ	77	B-025a	B-023b	150.0	PVC	110.0	1.608	0.091	0.122	HLZ
1088	P325 HLZ	74	B-023b	B-023a	150.0	PVC	110.0	1.269	0.072	0.079	HLZ
1177	P326 HLZ	141	B-049	B-049a	100.0	PVC	110.0	-0.088	0.011	0.004	HLZ
1178	P327 HLZ	154	B-049a	B-054	100.0	PVC	110.0	-0.560	0.071	0.125	HLZ
1180	P328 HLZ	68	B-045	B-045a	100.0	PVC	110.0	-0.017	0.002	0.000	HLZ
1181	P329 HLZ	199	B-045a	B-049	100.0	PVC	110.0	-0.433	0.055	0.077	HLZ
1183	P330 HLZ	70	B-055	B-055a	100.0	PVC	110.0	0.126	0.016	0.008	HLZ
1184	P331 HLZ	127	B-055a	B-055b	100.0	PVC	110.0	-0.213	0.027	0.021	HLZ
1186	P332 HLZ	81	B-014	B-014a	100.0	PVC	110.0	0.192	0.024	0.017	HLZ
1187	P333 HLZ	123	B-014a	B-015	100.0	PVC	110.0	-0.336	0.043	0.048	HLZ
1189	P334 HLZ	115	B-013	B-016a	150.0	PVC	110.0	-2.365	0.134	0.249	HLZ
1190	P335 HLZ	82	B-016a	B-016	150.0	PVC	110.0	-2.875	0.163	0.358	HLZ
1223	P337 HLZ	364	S-100	S-055	250.0	PVC	120.0	-39.062	0.796	3.177	HLZ
1225	P338 HLZ	43	S-001	S-100	200.0	PVC	120.0	-16.002	0.509	1.804	HLZ
1226	P339 HLZ	54	S-100	B-060	200.0	PVC	120.0	23.060	0.734	3.549	HLZ
1228	P340 HLZ	121	Teviot Road Connection 2	PRV-3	250.0	PVC	120.0	39.555	0.806	3.251	HLZ
1229	P341 HLZ	36	PRV-3	S-055	250.0	PVC	120.0	39.555	0.806	3.251	HLZ
1231	P342 HLZ	140	S-004	S-105	100.0	PVC	110.0	2.296	0.292	1.702	HLZ
1232	P343 HLZ	98	S-105	S-004a	100.0	PVC	110.0	0.151	0.019	0.011	HLZ
1234	P344 HLZ	71	S-105	S-110	100.0	PVC	110.0	2.145	0.273	1.500	HLZ
1236	P345 HLZ	119	S-021	S-115	150.0	PVC	110.0	-4.550	0.257	0.838	HLZ
1237	P346 HLZ	144	S-115	S-006	150.0	PVC	110.0	-4.029	0.228	0.669	HLZ
1238	P347 HLZ	40	S-110	S-115	100.0	PVC	110.0	0.521	0.066	0.109	HLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour HLZ (Ultimate) Pipes and Nodes Flex Tables (Including Irrigation Nodes)

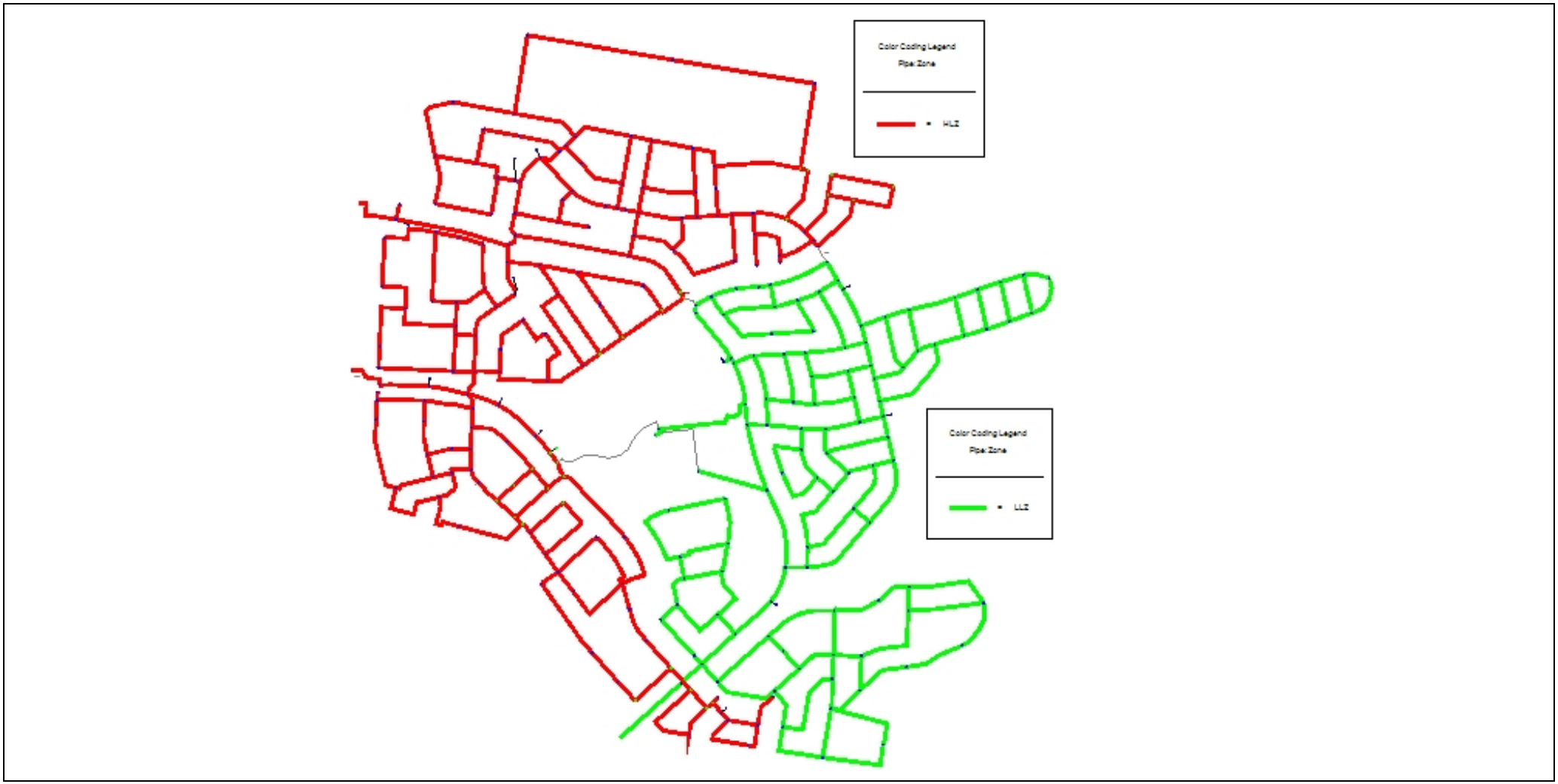
Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
1240	P348 HLZ	144	S-007	S-120	100.0	PVC	110.0	0.138	0.018	0.009	HLZ
1241	P349 HLZ	112	S-120	S-052	100.0	PVC	110.0	-1.184	0.151	0.499	HLZ
1249	P350 HLZ	75	S-042	S-024	100.0	PVC	110.0	-0.107	0.014	0.006	HLZ
755	P355 HLZ IRRIG	24	B-033	I-05	100.0	PVC	110.0	0.000	0.000	0.000	HLZ Irrigation

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

LLZ and HLZ Extents - Time: 19.00 hours



Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
B-067	44.5	0	0.000	<Collection: 0 items>	83.7	39.1
B-068	46.0	2	0.340	<Collection: 2 items>	83.7	37.6
B-068a	49.5	0	0.000	<Collection: 0 items>	83.6	34.0
B-068b	50.5	0	0.000	<Collection: 0 items>	83.6	33.0
B-069	50.5	2	0.585	<Collection: 2 items>	83.6	33.0
B-070	48.5	2	0.453	<Collection: 2 items>	83.6	35.0
B-071	45.3	2	0.491	<Collection: 2 items>	83.6	38.2
B-071a	47.0	2	0.246	<Collection: 2 items>	83.6	36.5
B-072	50.5	0	0.000	<Collection: 0 items>	83.6	33.0
B-073	49.0	2	0.510	<Collection: 2 items>	83.6	34.5
B-074	43.5	2	0.359	<Collection: 2 items>	83.6	40.0
B-075	49.5	0	0.000	<Collection: 0 items>	83.6	34.0
B-076	47.5	0	0.000	<Collection: 0 items>	83.6	36.0
B-078	45.0	2	0.396	<Collection: 2 items>	83.6	38.5
I-07	35.0	0	0.000	<Collection: 0 items>	84.2	49.1
I-SCHOOL	40.5	0	0.000	<Collection: 0 items>	83.8	43.2
I-SPORT & REC PARK	36.0	0	0.000	<Collection: 0 items>	84.1	48.0
J-269	45.0	0	0.000	<Collection: 0 items>	83.5	38.5
J-272	43.0	0	0.000	<Collection: 0 items>	83.5	40.4
J-273	44.1	0	0.000	<Collection: 0 items>	83.5	39.3
J-274	45.1	0	0.000	<Collection: 0 items>	83.5	38.3
J-275	44.7	0	0.000	<Collection: 0 items>	83.5	38.7
J-276	45.4	0	0.000	<Collection: 0 items>	83.5	38.0
J-277	45.3	0	0.000	<Collection: 0 items>	83.5	38.1
J-288	43.0	0	0.000	<Collection: 0 items>	83.6	40.6
J-291	38.5	0	0.000	<Collection: 0 items>	83.7	45.1
L-001	42.5	0	0.000	<Collection: 0 items>	84.6	42.0
L-002	42.0	0	0.000	<Collection: 0 items>	84.4	42.3
L-003	46.0	2	0.340	<Collection: 2 items>	84.2	38.1
L-004	49.0	2	0.491	<Collection: 2 items>	83.9	34.9
L-005	47.0	0	0.000	<Collection: 0 items>	83.7	36.7
L-006	45.0	2	0.264	<Collection: 2 items>	83.7	38.7
L-007	41.0	2	0.151	<Collection: 2 items>	83.5	42.4
L-008	40.5	2	0.528	<Collection: 2 items>	83.7	43.2

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
L-008a	35.0	2	0.321	<Collection: 2 items>	83.5	48.4
L-009	45.5	2	0.359	<Collection: 2 items>	83.6	38.0
L-010	36.5	2	0.548	<Collection: 2 items>	83.4	46.8
L-010a	41.0	0	0.000	<Collection: 0 items>	83.4	42.3
L-012	43.0	2	0.378	<Collection: 2 items>	83.5	40.4
L-013	38.0	0	0.000	<Collection: 0 items>	84.2	46.1
L-014	40.0	0	0.000	<Collection: 0 items>	84.0	43.9
L-015	41.0	0	0.000	<Collection: 0 items>	83.8	42.7
L-016	41.0	0	0.000	<Collection: 0 items>	83.8	42.7
L-017	43.0	0	0.000	<Collection: 0 items>	83.7	40.6
L-018	37.0	0	0.000	<Collection: 0 items>	84.1	47.0
L-019	31.5	0	0.000	<Collection: 0 items>	83.7	52.1
L-020	34.0	2	0.264	<Collection: 2 items>	83.6	49.5
L-021	38.0	2	0.321	<Collection: 2 items>	83.6	45.5
L-022	40.0	0	0.000	<Collection: 0 items>	83.6	43.5
L-023	43.0	0	0.000	<Collection: 0 items>	83.6	40.5
L-024	45.0	2	0.453	<Collection: 2 items>	83.6	38.5
L-025	40.0	2	0.321	<Collection: 2 items>	83.8	43.7
L-026	39.0	2	0.284	<Collection: 2 items>	83.7	44.6
L-027	37.0	2	0.302	<Collection: 2 items>	83.7	46.6
L-027a	36.5	2	0.189	<Collection: 2 items>	83.7	47.1
L-028	35.0	0	0.000	<Collection: 0 items>	83.6	48.5
L-029	40.0	2	0.321	<Collection: 2 items>	83.7	43.6
L-030	38.5	2	0.227	<Collection: 2 items>	83.6	45.0
L-031	37.5	2	0.208	<Collection: 2 items>	83.6	46.0
L-032	42.0	2	0.623	<Collection: 2 items>	83.7	41.6
L-033	44.0	2	0.246	<Collection: 2 items>	83.6	39.5
L-034	43.0	2	0.396	<Collection: 2 items>	84.4	41.3
L-034a	45.0	2	0.284	<Collection: 2 items>	84.3	39.1
L-035	45.9	2	0.623	<Collection: 2 items>	84.2	38.2
L-035a	44.3	0	0.000	<Collection: 0 items>	84.2	39.9
L-036	47.0	0	0.000	<Collection: 0 items>	84.2	37.1
L-037	41.5	2	0.387	<Collection: 2 items>	84.2	42.6
L-038	49.0	2	0.623	<Collection: 2 items>	84.2	35.1

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
L-039	39.0	2	0.208	<Collection: 2 items>	84.2	45.1
L-040	38.5	2	0.359	<Collection: 2 items>	84.2	45.6
L-040a	41.0	2	0.396	<Collection: 2 items>	84.2	43.1
L-041	35.5	2	0.302	<Collection: 2 items>	84.2	48.6
L-042	44.5	0	0.000	<Collection: 0 items>	83.5	38.9
L-043	46.0	2	0.959	<Collection: 2 items>	83.5	37.4
L-044	43.5	2	0.227	<Collection: 2 items>	83.5	39.9
L-045	41.0	2	0.396	<Collection: 2 items>	84.3	43.2
L-046	40.0	0	0.000	<Collection: 0 items>	84.1	44.0
L-047	46.0	0	0.000	<Collection: 0 items>	83.6	37.5
L-1000	35.0	2	0.151	<Collection: 2 items>	83.6	48.5
L-1005	46.0	2	0.151	<Collection: 2 items>	83.5	37.5
L-1010	42.5	2	0.302	<Collection: 2 items>	83.5	41.0
L-1015	46.0	2	0.189	<Collection: 2 items>	83.5	37.5
L-1020	44.0	2	0.396	<Collection: 2 items>	83.5	39.4
L-1025	38.0	2	1.039	<Collection: 2 items>	84.0	45.9
L-1030	35.0	2	0.510	<Collection: 2 items>	83.7	48.6
L-1035	36.0	2	0.416	<Collection: 2 items>	83.9	47.8
L-1040	37.0	2	0.434	<Collection: 2 items>	83.7	46.6
L-1045	32.5	2	0.321	<Collection: 2 items>	83.7	51.1
L-1050	40.5	2	0.208	<Collection: 2 items>	83.6	43.0
L-1055	41.5	2	0.227	<Collection: 2 items>	83.6	42.0
L-1060	39.5	2	0.264	<Collection: 2 items>	83.6	44.1
L-1065	40.0	2	0.227	<Collection: 2 items>	83.7	43.6
L-1075	41.0	2	0.887	<Collection: 2 items>	83.7	42.6
L-1080	38.0	0	0.000	<Collection: 0 items>	83.7	45.6
L-1085	33.6	0	0.000	<Collection: 0 items>	83.9	50.1
L-1090	37.0	2	2.075	<Collection: 2 items>	83.3	46.2
L-ECO-001	43.0	2	0.359	<Collection: 2 items>	83.4	40.3
L-ECO-002	42.0	2	0.887	<Collection: 2 items>	83.4	41.3
L-ECO-003	41.0	2	0.491	<Collection: 2 items>	83.4	42.3
L-ECO-004	40.0	2	0.378	<Collection: 2 items>	83.4	43.3
L-ECO-005	40.0	2	0.359	<Collection: 2 items>	83.4	43.3
L-ECO-006	37.0	2	0.396	<Collection: 2 items>	83.4	46.3

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Junction Table - Time: 19.00 hours

Label	Elevation (m)	Unit Demand Collection <Count>	Demand (L/s)	Unit Demand Collection	Hydraulic Grade (m)	Pressure (m H2O)
L-ECO-008	37.0	2	0.416	<Collection: 2 items>	83.4	46.4
L-ECO_007	41.0	0	0.000	<Collection: 0 items>	83.4	42.3
L-SCHOOL	40.5	2	0.991	<Collection: 2 items>	83.8	43.2
L-SPORT & REC CLUBHOUSE	45.5	2	0.081	<Collection: 2 items>	83.9	38.4
T-1010	40.3	0	0.000	<Collection: 0 items>	83.9	43.5

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
119	P001 LLZ	26	L-016	L-SCHOOL	150.0	PVC	110.0	0.991	0.056	0.050	LLZ
141	P002 LLZ	182	L-016	L-017	150.0	PVC	110.0	3.042	0.172	0.398	LLZ
178	P003 LLZ	75	L-005	L-006	100.0	PVC	110.0	-0.044	0.006	0.001	LLZ
183	P004 LLZ	104	L-004	L-005	100.0	PVC	110.0	2.386	0.304	1.827	LLZ
197	P005 LLZ	205	L-003	L-004	150.0	PVC	110.0	5.813	0.329	1.319	LLZ
198	P006 LLZ	215	L-008	L-003	100.0	PVC	110.0	-2.589	0.330	2.125	LLZ
199	P007 LLZ	67	L-006	L-008	100.0	PVC	110.0	-0.308	0.039	0.041	LLZ
211	P008 LLZ	75	L-012	L-007	100.0	PVC	110.0	-0.824	0.105	0.255	LLZ
224	P009 LLZ	71	L-036	L-038	100.0	PVC	110.0	0.863	0.110	0.278	LLZ
228	P010 LLZ	144	L-040	L-039	100.0	PVC	110.0	-0.438	0.056	0.079	LLZ
230	P011 LLZ	123	L-036	L-037	100.0	PVC	110.0	0.153	0.019	0.011	LLZ
232	P012 LLZ	89	L-039	L-037	100.0	PVC	110.0	-0.723	0.092	0.200	LLZ
233	P013 LLZ	165	L-038	L-039	100.0	PVC	110.0	-0.078	0.010	0.003	LLZ
235	P014 LLZ	68	L-013	L-018	150.0	PVC	110.0	5.980	0.338	1.390	LLZ
249	P015 LLZ	18	L-015	L-016	150.0	PVC	110.0	4.033	0.228	0.670	LLZ
251	P016 LLZ	67	L-015	L-032	100.0	PVC	110.0	1.812	0.231	1.098	LLZ
259	P017 LLZ	108	L-027	L-025	100.0	PVC	110.0	-1.260	0.160	0.560	LLZ
260	P018 LLZ	63	L-025	L-014	100.0	PVC	110.0	-3.211	0.409	3.168	LLZ
262	P019 LLZ	83	L-025	L-029	100.0	PVC	110.0	1.631	0.208	0.903	LLZ
263	P020 LLZ	143	L-029	L-032	100.0	PVC	110.0	0.026	0.003	0.000	LLZ
265	P021 LLZ	77	L-020	L-028	100.0	PVC	110.0	-0.369	0.047	0.058	LLZ
268	P022 LLZ	79	L-028	L-031	100.0	PVC	110.0	0.758	0.096	0.218	LLZ
270	P023 LLZ	41	L-021	L-022	100.0	PVC	110.0	-0.449	0.057	0.083	LLZ
271	P024 LLZ	75	L-022	L-023	100.0	PVC	110.0	0.507	0.064	0.104	LLZ
276	P025 LLZ	126	L-030	L-031	100.0	PVC	110.0	0.191	0.024	0.017	LLZ
283	P026 LLZ	54	L-023	L-024	100.0	PVC	110.0	0.774	0.099	0.227	LLZ
286	P027 LLZ	124	L-042	L-044	100.0	PVC	110.0	0.169	0.022	0.014	LLZ
293	P028 LLZ	143	L-002	L-045	250.0	PVC	120.0	17.282	0.352	0.702	LLZ
318	P029 LLZ	127	L-004	L-009	100.0	PVC	110.0	2.936	0.374	2.682	LLZ
319	P030 LLZ	215	L-009	L-010	100.0	PVC	110.0	1.546	0.197	0.818	LLZ
323	P031 LLZ	271	L-009	L-012	100.0	PVC	110.0	1.031	0.131	0.386	LLZ
327	P032 LLZ	106	L-035	L-036	100.0	PVC	110.0	1.016	0.129	0.376	LLZ
342	P033 LLZ	260	Round Mt	L-001	250.0	PVC	120.0	27.832	0.567	1.696	LLZ
344	P034 LLZ	89	L-001	L-002	250.0	PVC	120.0	27.832	0.567	1.696	LLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
345	P035 LLZ	74	L-002	L-003	150.0	PVC	110.0	8.741	0.495	2.808	LLZ
346	P036 LLZ	37	L-002	L-034	100.0	PVC	110.0	1.809	0.230	1.094	LLZ
348	P037 LLZ	151	L-045	L-041	250.0	PVC	120.0	15.419	0.314	0.568	LLZ
349	P038 LLZ	118	L-041	L-013	250.0	PVC	120.0	15.117	0.308	0.548	LLZ
357	P039 LLZ	163	L-ECO-002	L-ECO-003	100.0	PVC	110.0	0.146	0.019	0.010	LLZ
359	P040 LLZ	191	L-ECO-003	L-ECO-004	100.0	PVC	110.0	-0.345	0.044	0.051	LLZ
538	P041 LLZ	255	L-013	L-046	250.0	PVC	120.0	9.137	0.186	0.216	LLZ
539	P042 LLZ	215	L-046	L-014	200.0	PVC	120.0	9.137	0.291	0.639	LLZ
541	P043 LLZ	225	I-SPORT & REC PARK	L-046	200.0	PVC	120.0	0.000	0.000	0.000	LLZ
704	P044 LLZ	56	B-068	B-067	150.0	PVC	110.0	-3.042	0.172	0.398	LLZ
706	P045 LLZ	70	B-068	B-078	100.0	PVC	110.0	1.608	0.205	0.880	LLZ
708	P046 LLZ	163	B-078	B-070	100.0	PVC	110.0	0.596	0.076	0.140	LLZ
710	P047 LLZ	193	B-075	B-069	100.0	PVC	110.0	-0.272	0.035	0.033	LLZ
712	P048 LLZ	69	B-070	B-069	100.0	PVC	110.0	-0.236	0.030	0.025	LLZ
714	P049 LLZ	75	B-070	B-072	100.0	PVC	110.0	0.379	0.048	0.061	LLZ
717	P050 LLZ	183	B-071	B-078	100.0	PVC	110.0	-0.616	0.078	0.149	LLZ
719	P051 LLZ	74	B-072	B-073	100.0	PVC	110.0	0.258	0.033	0.030	LLZ
723	P052 LLZ	68	B-073	B-076	100.0	PVC	110.0	0.044	0.006	0.001	LLZ
725	P053 LLZ	129	L-024	L-047	100.0	PVC	110.0	-0.316	0.040	0.043	LLZ
728	P054 LLZ	68	B-076	B-075	100.0	PVC	110.0	-0.272	0.035	0.033	LLZ
730	P055 LLZ	195	B-073	B-074	100.0	PVC	110.0	-0.295	0.038	0.038	LLZ
837	P056 LLZ	88	L-007	L-ECO-001	100.0	PVC	110.0	1.619	0.206	0.891	LLZ
855	P057 LLZ	49	L-020	L-1000	100.0	PVC	110.0	1.609	0.205	0.881	LLZ
856	P058 LLZ	74	L-1000	L-021	100.0	PVC	110.0	0.757	0.096	0.218	LLZ
859	P059 LLZ	96	L-1005	L-042	100.0	PVC	110.0	0.681	0.087	0.179	LLZ
860	P060 LLZ	292	L-1000	L-1005	100.0	PVC	110.0	0.701	0.089	0.189	LLZ
866	P061 LLZ	102	L-021	L-1010	100.0	PVC	110.0	0.886	0.113	0.292	LLZ
869	P062 LLZ	82	L-024	J-269	100.0	PVC	110.0	0.638	0.081	0.159	LLZ
871	P063 LLZ	174	L-1010	J-269	100.0	PVC	110.0	0.012	0.002	0.000	LLZ
873	P064 LLZ	68	L-1010	L-1015	100.0	PVC	110.0	0.571	0.073	0.129	LLZ
874	P065 LLZ	58	L-1015	L-1005	100.0	PVC	110.0	0.131	0.017	0.008	LLZ
876	P066 LLZ	76	J-269	L-1020	100.0	PVC	110.0	0.650	0.083	0.164	LLZ
877	P067 LLZ	151	L-1020	L-044	100.0	PVC	110.0	0.505	0.064	0.103	LLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
878	P068 LLZ	133	L-1015	L-1020	100.0	PVC	110.0	0.252	0.032	0.028	LLZ
880	P069 LLZ	75	L-042	J-272	100.0	PVC	110.0	0.512	0.065	0.105	LLZ
884	P070 LLZ	76	J-273	L-044	100.0	PVC	110.0	-0.447	0.057	0.082	LLZ
885	P071 LLZ	127	J-272	J-273	100.0	PVC	110.0	0.031	0.004	0.001	LLZ
887	P072 LLZ	76	J-272	J-274	100.0	PVC	110.0	0.481	0.061	0.094	LLZ
891	P073 LLZ	76	J-275	J-273	100.0	PVC	110.0	-0.478	0.061	0.093	LLZ
892	P074 LLZ	127	J-274	J-275	100.0	PVC	110.0	0.008	0.001	0.000	LLZ
894	P075 LLZ	75	J-274	J-276	100.0	PVC	110.0	0.473	0.060	0.091	LLZ
895	P076 LLZ	141	J-276	L-043	100.0	PVC	110.0	0.416	0.053	0.072	LLZ
897	P077 LLZ	84	L-043	J-277	100.0	PVC	110.0	-0.543	0.069	0.118	LLZ
898	P078 LLZ	74	J-277	J-275	100.0	PVC	110.0	-0.486	0.062	0.096	LLZ
899	P079 LLZ	123	J-276	J-277	100.0	PVC	110.0	0.057	0.007	0.002	LLZ
901	P080 LLZ	64	L-018	L-1025	150.0	PVC	110.0	4.447	0.252	0.803	LLZ
902	P081 LLZ	230	L-1025	L-026	100.0	PVC	110.0	1.886	0.240	1.182	LLZ
905	P082 LLZ	67	L-1030	L-019	100.0	PVC	110.0	0.305	0.039	0.040	LLZ
908	P083 LLZ	256	L-018	L-1085	100.0	PVC	110.0	1.532	0.195	0.805	LLZ
909	P084 LLZ	224	L-1085	L-019	100.0	PVC	110.0	1.217	0.155	0.525	LLZ
911	P085 LLZ	198	L-1025	L-1035	100.0	PVC	110.0	1.522	0.194	0.795	LLZ
912	P086 LLZ	160	L-1035	L-1030	100.0	PVC	110.0	1.422	0.181	0.701	LLZ
913	P087 LLZ	67	L-1085	L-1035	100.0	PVC	110.0	0.315	0.040	0.043	LLZ
915	P088 LLZ	76	L-026	L-1080	100.0	PVC	110.0	0.529	0.067	0.112	LLZ
916	P089 LLZ	81	L-1080	L-1030	100.0	PVC	110.0	-0.608	0.077	0.145	LLZ
918	P090 LLZ	110	L-028	L-027a	100.0	PVC	110.0	-1.127	0.143	0.455	LLZ
919	P091 LLZ	76	L-027a	L-027	100.0	PVC	110.0	-0.917	0.117	0.311	LLZ
922	P092 LLZ	93	L-1080	L-1040	100.0	PVC	110.0	1.137	0.145	0.463	LLZ
923	P093 LLZ	78	L-1040	L-027a	100.0	PVC	110.0	0.399	0.051	0.067	LLZ
925	P094 LLZ	75	L-019	L-1045	100.0	PVC	110.0	1.522	0.194	0.794	LLZ
926	P095 LLZ	67	L-1045	L-020	100.0	PVC	110.0	1.504	0.192	0.777	LLZ
927	P096 LLZ	202	L-1040	L-1045	100.0	PVC	110.0	0.303	0.039	0.040	LLZ
929	P097 LLZ	85	L-031	L-1050	100.0	PVC	110.0	0.741	0.094	0.210	LLZ
930	P098 LLZ	76	L-1050	L-022	100.0	PVC	110.0	0.956	0.122	0.336	LLZ
932	P099 LLZ	86	L-030	L-1055	100.0	PVC	110.0	0.580	0.074	0.133	LLZ
933	P100 LLZ	79	L-1055	L-033	100.0	PVC	110.0	-0.069	0.009	0.003	LLZ
934	P101 LLZ	116	L-1050	L-1055	100.0	PVC	110.0	-0.422	0.054	0.074	LLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
936	P102 LLZ	96	L-032	J-288	100.0	PVC	110.0	1.215	0.155	0.524	LLZ
937	P103 LLZ	66	J-288	L-033	100.0	PVC	110.0	1.237	0.157	0.541	LLZ
939	P104 LLZ	86	L-029	L-1060	100.0	PVC	110.0	1.284	0.163	0.580	LLZ
940	P105 LLZ	68	L-1060	L-030	100.0	PVC	110.0	0.998	0.127	0.363	LLZ
941	P106 LLZ	155	J-288	L-1060	100.0	PVC	110.0	-0.022	0.003	0.000	LLZ
943	P107 LLZ	66	L-026	L-1065	100.0	PVC	110.0	1.073	0.137	0.416	LLZ
946	P108 LLZ	105	L-1065	J-291	100.0	PVC	110.0	0.361	0.046	0.055	LLZ
947	P109 LLZ	66	J-291	L-027	100.0	PVC	110.0	-0.041	0.005	0.001	LLZ
965	P110 LLZ	83	B-068a	B-068	100.0	PVC	110.0	-1.094	0.139	0.431	LLZ
967	P111 LLZ	38	B-069	B-068b	100.0	PVC	110.0	-1.094	0.139	0.431	LLZ
968	P112 LLZ	71	B-068b	B-068a	100.0	PVC	110.0	-1.094	0.139	0.431	LLZ
970	P113 LLZ	113	B-072	B-071a	100.0	PVC	110.0	0.121	0.015	0.007	LLZ
971	P114 LLZ	131	B-071a	B-071	100.0	PVC	110.0	-0.125	0.016	0.008	LLZ
989	P115 LLZ	142	L-007	L-008a	100.0	PVC	110.0	-0.164	0.021	0.013	LLZ
990	P116 LLZ	231	L-008a	L-008	100.0	PVC	110.0	-1.752	0.223	1.031	LLZ
999	P117 LLZ	179	L-037	L-035a	100.0	PVC	110.0	-0.957	0.122	0.337	LLZ
1000	P118 LLZ	184	L-035a	L-035	100.0	PVC	110.0	0.509	0.065	0.105	LLZ
1001	P119 LLZ	80	L-035a	L-045	100.0	PVC	110.0	-1.467	0.187	0.742	LLZ
1032	P120 LLZ	65	L-014	T-1010	200.0	PVC	120.0	5.926	0.189	0.287	LLZ
1033	P121 LLZ	136	T-1010	L-015	150.0	PVC	110.0	5.845	0.331	1.333	LLZ
1039	P122 LLZ	314	T-1005	T-1010	200.0	PVC	120.0	-0.081	0.003	0.000	LLZ
1040	P123 LLZ	31	T-1005	L-SPORT & REC CLUBHOUSE	150.0	PVC	110.0	0.081	0.005	0.001	LLZ
1154	P124 LLZ	125	L-005	L-007	100.0	PVC	110.0	2.430	0.309	1.890	LLZ
1157	P125 LLZ	155	L-010	L-010a	100.0	PVC	110.0	-0.041	0.005	0.001	LLZ
1158	P126 LLZ	95	L-010a	L-012	100.0	PVC	110.0	-1.477	0.188	0.752	LLZ
1161	P127 LLZ	117	L-010a	L-ECO-005	100.0	PVC	110.0	0.400	0.051	0.067	LLZ
1162	P128 LLZ	171	L-ECO-005	L-ECO-004	100.0	PVC	110.0	0.723	0.092	0.200	LLZ
1163	P129 LLZ	109	L-ECO-001	L-ECO-005	100.0	PVC	110.0	0.682	0.087	0.180	LLZ
1167	P130 LLZ	272	L-ECO-006	L-ECO-002	100.0	PVC	110.0	0.498	0.063	0.100	LLZ
1169	P131 LLZ	259	L-ECO-001	L-ECO_007	100.0	PVC	110.0	0.578	0.074	0.132	LLZ
1170	P132 LLZ	238	L-ECO_007	L-ECO-002	100.0	PVC	110.0	0.536	0.068	0.115	LLZ
1171	P133 LLZ	74	L-ECO-006	L-ECO_007	100.0	PVC	110.0	-0.043	0.005	0.001	LLZ

Greenbank (Everleigh) Water Supply Network Model

Peak Hour LLZ (Ultimate) Pipes and Nodes Flex Tables (Includes Irrigation Demands)

Pipe Table - Time: 19.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Zone
1173	P134 LLZ	149	L-008a	L-ECO-008	100.0	PVC	110.0	1.267	0.161	0.566	LLZ
1174	P135 LLZ	113	L-ECO-008	L-ECO-006	100.0	PVC	110.0	0.852	0.108	0.271	LLZ
1192	P136 LLZ	154	L-034	L-034a	100.0	PVC	110.0	1.413	0.180	0.692	LLZ
1193	P137 LLZ	70	L-034a	L-035	100.0	PVC	110.0	1.129	0.144	0.457	LLZ
1195	P138 LLZ	262	L-038	L-040a	100.0	PVC	110.0	0.318	0.040	0.044	LLZ
1196	P139 LLZ	182	L-040a	L-040	100.0	PVC	110.0	-0.079	0.010	0.003	LLZ
1198	P140 LLZ	183	L-1065	L-1075	100.0	PVC	110.0	0.485	0.062	0.096	LLZ
1199	P141 LLZ	172	L-1075	J-291	100.0	PVC	110.0	-0.402	0.051	0.068	LLZ
1200	P142 LLZ	25	L-017	B-067	150.0	PVC	110.0	3.042	0.172	0.397	LLZ
1201	P143 LLZ	32	B-076	L-047	100.0	PVC	110.0	0.316	0.040	0.043	LLZ
1204	P144 LLZ	127	L-033	B-074	100.0	PVC	110.0	0.922	0.117	0.314	LLZ
1205	P145 LLZ	67	B-074	L-023	100.0	PVC	110.0	0.268	0.034	0.032	LLZ
1247	P146 LLZ	249	L-010	L-1090	100.0	PVC	110.0	1.038	0.132	0.392	LLZ
1248	P147 LLZ	250	L-1090	L-010a	100.0	PVC	110.0	-1.037	0.132	0.390	LLZ
991	P296 HLZ	92	B-012	B-002	100.0	PVC	110.0	1.360	0.173	0.645	HLZ
785	P364 LLZ IRRIG	19	L-041	I-07	100.0	PVC	110.0	0.000	0.000	0.000	LLZ Irrigation
798	P366 LLZ IRRIG	15	L-SCHOOL	I-SCHOOL	100.0	PVC	110.0	0.000	0.000	0.000	LLZ Irrigation

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes HLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
B-058	15.000	30.000	15.205	30.205	12.0	31.4	14.7	0.0	14.7	S-016
B-043	15.000	30.000	15.000	30.000	12.0	36.9	16.8	0.0	16.8	S-016
B-003	15.000	18.409	15.000	18.409	12.0	29.1	18.7	0.0	18.7	S-016
S-005	15.000	28.263	15.460	28.722	12.0	16.1	12.0	0.0	12.0	S-016
S-001	15.000	30.000	15.341	30.341	12.0	16.0	12.7	0.0	12.7	S-016
B-041	15.000	30.000	15.000	30.000	12.0	37.3	17.9	0.0	17.9	S-016
B-026	15.000	30.000	15.000	30.000	12.0	46.5	17.9	0.0	17.9	S-016
B-023	15.000	30.000	15.392	30.392	12.0	43.7	17.9	0.0	17.9	S-016
S-055	15.000	30.000	15.000	30.000	12.0	14.8	13.2	0.0	13.2	S-016
S-015	15.000	22.418	15.443	22.860	12.0	12.0	12.5	0.0	12.5	S-016
B-016	15.000	30.000	15.205	30.205	12.0	30.3	17.9	0.0	17.9	S-016
B-066	15.000	19.635	15.000	19.635	12.0	30.4	16.5	0.0	16.5	S-016
S-006	15.000	27.681	15.000	27.681	12.0	16.5	12.0	0.0	12.0	S-016
S-027	15.000	27.491	15.170	27.662	12.0	25.4	12.0	0.0	12.0	S-016
S-016	15.000	16.247	15.637	16.885	12.0	12.0	15.3	0.0	15.3	S-015
S-009	15.000	26.529	15.289	26.818	12.0	16.9	12.0	0.0	12.0	S-016
S-007	15.000	26.617	15.000	26.617	12.0	16.3	12.0	0.0	12.0	S-016
S-014	15.000	25.457	15.273	25.729	12.0	13.0	12.0	0.0	12.0	S-015
S-020	15.000	23.582	15.000	23.582	12.0	12.0	12.1	0.0	12.1	S-016
S-017	15.000	20.375	15.357	20.732	12.0	18.5	12.0	0.0	12.0	S-016
S-018	15.000	22.995	15.273	23.268	12.0	14.0	12.0	0.0	12.0	S-016
S-012	15.000	27.468	15.205	27.672	12.0	21.0	12.0	0.0	12.0	S-016
S-026	15.000	27.569	15.000	27.569	12.0	27.4	12.0	0.0	12.0	S-016
S-010	15.000	27.126	15.392	27.517	12.0	18.2	12.0	0.0	12.0	S-016
S-022	15.000	27.613	15.000	27.613	12.0	25.7	12.0	0.0	12.0	S-016
S-008	15.000	26.681	15.000	26.681	12.0	16.4	12.0	0.0	12.0	S-016
S-034	15.000	27.247	15.306	27.553	12.0	23.7	12.0	0.0	12.0	S-016
S-011	15.000	27.354	15.443	27.797	12.0	19.2	12.0	0.0	12.0	S-016
S-024	15.000	27.631	15.273	27.904	12.0	25.7	12.0	0.0	12.0	S-016
S-035	15.000	27.530	15.341	27.871	12.0	25.1	12.0	0.0	12.0	S-016
S-036	15.000	27.526	15.375	27.900	12.0	27.6	12.0	0.0	12.0	S-016
S-004	15.000	30.000	15.000	30.000	12.0	16.2	12.1	0.0	12.1	S-016

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes HLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
S-021	15.000	27.657	15.170	27.827	12.0	23.3	12.0	0.0	12.0	S-016
S-023	15.000	27.618	15.000	27.618	12.0	25.4	12.0	0.0	12.0	S-016
S-028	15.000	27.477	15.000	27.477	12.0	25.3	12.0	0.0	12.0	S-016
S-025	15.000	27.590	15.000	27.590	12.0	27.2	12.0	0.0	12.0	S-016
S-043	15.000	27.664	15.273	27.937	12.0	24.8	12.0	0.0	12.0	S-016
S-029	15.000	26.867	15.306	27.173	12.0	22.6	12.2	0.0	12.2	S-016
S-045	15.000	26.751	15.341	27.092	12.0	17.0	12.2	0.0	12.2	S-016
S-046	15.000	19.635	15.000	19.635	12.0	16.7	14.7	0.0	14.7	S-016
S-032	15.000	27.406	15.000	27.406	12.0	15.1	12.0	0.0	12.0	S-016
S-033	15.000	24.365	15.494	24.859	12.0	18.1	13.1	0.0	13.1	S-016
S-040	15.000	23.364	15.375	23.739	12.0	12.1	13.5	0.0	13.5	S-016
S-031	15.000	27.404	15.000	27.404	12.0	16.5	12.0	0.0	12.0	S-016
S-030	15.000	27.382	15.000	27.382	12.0	21.2	12.0	0.0	12.0	S-016
S-038	15.000	27.255	15.476	27.731	12.0	23.9	12.0	0.0	12.0	S-016
S-013	15.000	27.449	15.273	27.722	12.0	23.3	12.0	0.0	12.0	S-016
S-042	15.000	28.011	15.221	28.232	12.0	21.3	12.0	0.0	12.0	S-016
S-002	15.000	28.594	15.664	29.258	12.0	19.9	12.0	0.0	12.0	S-016
S-003	15.000	19.294	15.341	19.635	12.0	21.4	15.0	0.0	15.0	S-016
S-047	15.000	27.382	15.357	27.739	12.0	12.2	12.0	0.0	12.0	S-016
S-048	15.000	19.635	15.000	19.635	12.0	22.7	14.7	0.0	14.7	S-016
S-044	15.000	27.560	15.357	27.918	12.0	21.4	12.0	0.0	12.0	S-016
S-019	15.000	24.745	15.119	24.864	12.0	12.0	12.0	0.0	12.0	S-016
S-049	15.000	22.203	15.000	22.203	12.0	13.5	12.0	0.0	12.0	S-050
S-051	15.000	21.588	15.000	21.588	12.0	16.3	12.0	0.0	12.0	S-050
S-037	15.000	27.231	15.000	27.231	12.0	24.6	12.0	0.0	12.0	S-016
S-054	15.000	26.944	15.273	27.217	12.0	12.8	12.0	0.0	12.0	S-040
S-039	15.000	25.743	15.000	25.743	12.0	12.6	12.0	0.0	12.0	S-040
S-041	15.000	26.669	15.000	26.669	12.0	12.4	12.1	0.0	12.1	S-040
S-052	15.000	24.723	15.000	24.723	12.0	12.1	12.0	0.0	12.0	S-016
B-002	15.000	18.409	15.392	18.801	12.0	35.5	18.7	0.0	18.7	S-016
B-009	15.000	18.409	15.324	18.733	12.0	23.1	18.7	0.0	18.7	S-016
B-010	15.000	18.409	15.000	18.409	12.0	25.2	18.7	0.0	18.7	S-016

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes HLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
B-004	15.000	18.409	15.000	18.409	12.0	27.3	18.7	0.0	18.7	S-016
B-006	15.000	18.409	15.221	18.630	12.0	20.0	18.7	0.0	18.7	S-016
B-007	15.000	18.409	15.000	18.409	12.0	18.1	17.6	0.0	17.6	B-008
B-011	15.000	18.409	15.289	18.698	12.0	16.3	18.6	0.0	18.6	B-008
B-008	15.000	17.850	15.000	17.850	12.0	12.0	18.7	0.0	18.7	S-016
B-012	15.000	30.000	15.205	30.205	12.0	36.5	17.9	0.0	17.9	S-016
B-014	15.000	30.000	15.256	30.256	12.0	24.4	17.9	0.0	17.9	S-016
B-015	15.000	30.000	15.426	30.426	12.0	15.4	17.9	0.0	17.9	S-016
B-013	15.000	30.000	15.273	30.273	12.0	33.1	17.9	0.0	17.9	S-016
B-017	15.000	30.000	15.460	30.460	12.0	19.9	17.9	0.0	17.9	S-016
B-019	15.000	30.000	15.528	30.528	12.0	26.5	17.9	0.0	17.9	S-016
B-018	15.000	30.000	15.238	30.238	12.0	26.5	17.9	0.0	17.9	S-016
B-024	15.000	30.000	15.392	30.392	12.0	35.5	17.9	0.0	17.9	S-016
B-021	15.000	30.000	15.221	30.221	12.0	38.4	17.9	0.0	17.9	S-016
B-025	15.000	30.000	15.476	30.476	12.0	45.1	17.9	0.0	17.9	S-016
B-036	15.000	30.000	15.000	30.000	12.0	33.1	17.9	0.0	17.9	S-016
B-022	15.000	30.000	15.000	30.000	12.0	41.5	17.9	0.0	17.9	S-016
B-030	15.000	30.000	15.426	30.426	12.0	38.2	17.9	0.0	17.9	S-016
B-028	15.000	30.000	15.000	30.000	12.0	37.3	17.9	0.0	17.9	S-016
B-031	15.000	30.000	15.000	30.000	12.0	36.0	17.9	0.0	17.9	S-016
B-029	15.000	30.000	15.000	30.000	12.0	36.6	17.9	0.0	17.9	S-016
B-038	15.000	30.000	15.408	30.408	12.0	28.4	17.9	0.0	17.9	S-016
B-037	15.000	30.000	15.460	30.460	12.0	35.4	17.9	0.0	17.9	S-016
B-032	15.000	30.000	15.324	30.324	12.0	34.0	17.9	0.0	17.9	S-016
B-039	15.000	30.000	15.238	30.238	12.0	26.3	17.9	0.0	17.9	S-016
B-044	15.000	30.000	15.000	30.000	12.0	33.8	16.6	0.0	16.6	S-016
B-045	15.000	30.000	15.392	30.392	12.0	20.2	16.5	0.0	16.5	S-016
B-049	15.000	30.000	15.613	30.613	12.0	15.1	13.1	0.0	13.1	B-049a
B-048	15.000	30.000	15.000	30.000	12.0	26.8	15.1	0.0	15.1	B-080
B-047	15.000	30.000	15.357	30.357	12.0	30.0	15.9	0.0	15.9	B-080
B-046	15.000	30.000	15.273	30.273	12.0	32.3	16.0	0.0	16.0	S-016
B-050	15.000	30.000	15.408	30.408	12.0	21.6	13.6	0.0	13.6	B-080

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes HLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
B-052	15.000	30.000	15.205	30.205	12.0	19.3	13.4	0.0	13.4	B-080
B-053	15.000	22.159	15.494	22.652	12.0	12.0	12.8	0.0	12.8	B-080
B-054	15.000	20.142	15.205	20.347	12.0	12.0	15.2	0.0	15.2	B-053
B-051	15.000	30.000	15.357	30.357	12.0	26.3	15.2	0.0	15.2	S-016
B-064	15.000	30.000	15.562	30.562	12.0	21.1	14.2	0.0	14.2	S-016
B-061	15.000	30.000	15.289	30.289	12.0	23.8	14.0	0.0	14.0	S-016
B-062	15.000	30.000	15.238	30.238	12.0	31.4	14.3	0.0	14.3	S-016
B-063	15.000	30.000	15.000	30.000	12.0	21.9	14.3	0.0	14.3	S-016
B-059	15.000	30.000	15.528	30.528	12.0	25.2	14.4	0.0	14.4	S-016
B-060	15.000	30.000	15.000	30.000	12.0	20.7	13.7	0.0	13.7	S-016
B-055	15.000	30.000	15.000	30.000	12.0	37.2	16.4	0.0	16.4	S-016
B-057	15.000	30.000	15.375	30.375	12.0	21.4	15.9	0.0	15.9	S-016
B-056	15.000	30.000	15.221	30.221	12.0	34.0	15.6	0.0	15.6	S-016
B-065	15.000	30.000	15.000	30.000	12.0	23.2	14.3	0.0	14.3	S-016
B-042	15.000	30.000	15.000	30.000	12.0	32.3	18.6	0.0	18.6	S-016
B-035	15.000	30.000	15.000	30.000	12.0	38.0	17.9	0.0	17.9	S-016
I-02	15.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-040	15.000	30.000	15.000	30.000	12.0	22.6	17.9	0.0	17.9	S-016
B-034	15.000	30.000	15.000	30.000	12.0	39.8	17.9	0.0	17.9	S-016
I-04	15.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-033	15.000	30.000	15.000	30.000	12.0	43.7	17.9	0.0	17.9	S-016
I-05	15.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-027	15.000	30.000	15.494	30.494	12.0	40.1	17.9	0.0	17.9	S-016
B-005	15.000	18.409	15.000	18.409	12.0	21.8	18.7	0.0	18.7	S-016
S-053	15.000	27.456	15.000	27.456	12.0	13.0	12.0	0.0	12.0	S-016
S-NEIGHBOURHOOD CENTRE	30.000	33.929	31.148	35.076	12.0	15.5	12.0	0.0	12.0	S-016
B-077	15.000	30.000	15.000	30.000	12.0	26.1	14.6	0.0	14.6	S-016
B-079	15.000	30.000	15.000	30.000	12.0	28.7	19.5	0.0	19.5	S-016
B-080	15.000	20.123	15.238	20.361	12.0	12.0	14.4	0.0	14.4	B-053
B-081	15.000	29.463	15.306	29.770	12.0	15.9	12.2	0.0	12.2	B-053

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes HLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
B-082	15.000	22.803	15.221	23.024	12.0	13.4	12.0	0.0	12.0	B-080
S-044a	15.000	27.537	15.375	27.912	12.0	18.4	12.0	0.0	12.0	S-016
S-004a	15.000	19.499	15.136	19.635	12.0	17.5	15.0	0.0	15.0	S-016
B-058a	15.000	30.000	15.273	30.273	12.0	33.1	14.5	0.0	14.5	S-016
B-055b	15.000	30.000	15.221	30.221	12.0	18.0	16.1	0.0	16.1	S-016
B-018a	15.000	24.832	15.289	25.121	12.0	21.7	18.2	0.0	18.2	S-016
T-1001	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-064a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-027a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-008a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-036a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-039a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-038a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-031a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-028a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-031b	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-030a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-025a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-023a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-023b	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-049a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-045a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-055a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-014a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-016a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-100	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-105	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-110	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-115	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
S-120	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes LLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
L-002	15.000	30.000	15.000	30.000	12.0	41.0	33.7	0.0	19.7	S-016
L-013	15.000	30.000	15.000	30.000	12.0	43.5	33.5	0.0	19.7	S-016
B-067	15.000	30.000	15.000	30.000	12.0	29.9	19.7	0.0	19.7	S-016
L-005	15.000	30.000	15.000	30.000	12.0	24.5	27.6	0.0	19.7	S-016
L-020	15.000	30.000	15.238	30.238	12.0	40.7	30.0	0.0	19.7	S-016
L-021	15.000	30.000	15.289	30.289	12.0	35.1	28.3	0.0	19.7	S-016
B-075	15.000	30.000	15.000	30.000	12.0	18.2	19.7	0.0	19.7	S-016
L-042	15.000	30.000	15.000	30.000	12.0	18.5	17.6	0.0	17.6	L-043
L-016	15.000	30.000	15.000	30.000	12.0	35.9	31.4	0.0	19.7	S-016
L-SCHOOL	30.000	41.871	32.308	44.179	12.0	30.7	27.6	0.0	19.7	S-016
L-017	15.000	30.000	15.000	30.000	12.0	31.6	30.3	0.0	19.7	S-016
L-006	15.000	30.000	15.238	30.238	12.0	24.2	25.7	0.0	19.7	S-016
L-007	15.000	30.000	15.136	30.136	12.0	27.4	25.7	0.0	19.7	S-016
L-004	15.000	30.000	15.443	30.443	12.0	26.9	29.0	0.0	19.7	S-016
L-010	15.000	30.000	15.494	30.494	12.0	25.4	24.3	0.0	19.7	S-016
L-008	15.000	30.000	15.476	30.476	12.0	30.1	26.7	0.0	19.7	S-016
L-003	15.000	30.000	15.306	30.306	12.0	34.4	31.2	0.0	19.7	S-016
L-009	15.000	30.000	15.324	30.324	12.0	22.2	27.3	0.0	19.7	S-016
L-012	15.000	30.000	15.341	30.341	12.0	23.7	25.3	0.0	19.7	S-016
L-036	15.000	29.177	15.000	29.177	12.0	21.2	19.6	0.0	19.6	L-038
L-038	15.000	28.945	15.562	29.506	12.0	15.3	22.1	0.0	19.7	S-016
L-040	15.000	28.920	15.324	29.244	12.0	16.3	16.7	0.0	16.7	L-038
L-039	15.000	28.884	15.187	29.071	12.0	24.9	17.6	0.0	17.6	L-038
L-037	15.000	28.614	15.349	28.963	12.0	26.8	20.6	0.0	19.7	S-016
L-018	15.000	30.000	15.000	30.000	12.0	43.0	33.5	0.0	19.7	S-016
L-026	15.000	30.000	15.256	30.256	12.0	35.7	32.2	0.0	19.7	S-016
L-019	15.000	30.000	15.000	30.000	12.0	43.3	31.8	0.0	19.7	S-016
L-027	15.000	30.000	15.273	30.273	12.0	38.0	31.9	0.0	19.7	S-016
L-015	15.000	30.000	15.000	30.000	12.0	36.2	31.6	0.0	19.7	S-016
L-032	15.000	30.000	15.562	30.562	12.0	33.1	31.5	0.0	19.7	S-016
L-033	15.000	30.000	15.221	30.221	12.0	29.8	30.3	0.0	19.7	S-016
L-023	15.000	30.000	15.000	30.000	12.0	30.3	28.9	0.0	19.7	S-016

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes LLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
L-025	15.000	30.000	15.289	30.289	12.0	36.7	32.2	0.0	19.7	S-016
L-029	15.000	30.000	15.289	30.289	12.0	35.0	31.5	0.0	19.7	S-016
L-028	15.000	30.000	15.000	30.000	12.0	39.6	30.5	0.0	19.7	S-016
L-031	15.000	30.000	15.187	30.187	12.0	36.3	30.3	0.0	19.7	S-016
L-022	15.000	30.000	15.000	30.000	12.0	33.7	28.9	0.0	19.7	S-016
L-030	15.000	30.000	15.205	30.205	12.0	35.3	30.5	0.0	19.7	S-016
L-043	15.000	24.408	15.865	25.273	12.0	12.0	16.3	0.0	16.3	J-276
L-044	15.000	30.000	15.205	30.205	12.0	19.0	17.4	0.0	17.4	L-043
L-024	15.000	30.000	15.408	30.408	12.0	27.4	28.2	0.0	19.7	S-016
L-045	15.000	30.000	15.357	30.357	12.0	41.5	33.5	0.0	19.7	S-016
L-SPORT & REC CLUBHOUSE	30.000	43.991	30.188	44.179	12.0	24.8	29.6	0.0	19.7	S-016
L-034	15.000	23.663	15.357	24.021	12.0	37.6	32.8	0.0	19.7	S-016
L-014	15.000	30.000	15.000	30.000	12.0	39.4	33.3	0.0	19.7	S-016
L-001	15.000	30.000	15.000	30.000	12.0	41.0	34.1	0.0	19.7	S-016
L-041	15.000	30.000	15.273	30.273	12.0	46.4	33.5	0.0	19.7	S-016
L-ECO-001	15.000	30.000	15.324	30.324	12.0	21.3	24.1	0.0	19.7	S-016
L-ECO-002	15.000	30.000	15.800	30.800	12.0	12.8	17.2	0.0	17.2	L-ECO-003
L-ECO-003	15.000	28.446	15.443	28.889	12.0	12.0	19.0	0.0	19.0	L-ECO-002
L-ECO-004	15.000	30.000	15.341	30.341	12.0	12.4	16.7	0.0	16.7	L-ECO-003
L-046	15.000	30.000	15.000	30.000	12.0	40.8	33.5	0.0	19.7	S-016
I-SPORT & REC PARK	30.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
B-068	15.000	30.000	15.306	30.306	12.0	27.9	19.7	0.0	19.7	S-016
B-078	15.000	30.000	15.357	30.357	12.0	25.6	19.7	0.0	19.7	S-016
B-070	15.000	30.000	15.408	30.408	12.0	22.3	19.7	0.0	19.7	S-016
B-069	15.000	30.000	15.528	30.528	12.0	20.0	19.7	0.0	19.7	S-016
B-072	15.000	30.000	15.000	30.000	12.0	20.1	19.7	0.0	19.7	S-016
B-071	15.000	30.000	15.443	30.443	12.0	16.9	19.7	0.0	19.7	S-016
B-073	15.000	30.000	15.460	30.460	12.0	22.6	19.7	0.0	19.7	S-016
B-076	15.000	30.000	15.000	30.000	12.0	23.7	19.7	0.0	19.7	S-016

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes LLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
L-047	15.000	30.000	15.000	30.000	12.0	24.2	29.5	0.0	19.7	S-016
B-074	15.000	30.000	15.324	30.324	12.0	29.2	19.7	0.0	19.7	S-016
I-07	15.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
I-SCHOOL	15.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-1000	15.000	30.000	15.136	30.136	12.0	38.2	28.5	0.0	19.7	S-016
L-1005	15.000	30.000	15.136	30.136	12.0	21.9	22.8	0.0	19.7	S-016
L-1010	15.000	30.000	15.273	30.273	12.0	27.7	25.5	0.0	19.7	S-016
J-269	15.000	30.000	15.000	30.000	12.0	25.2	25.7	0.0	19.7	S-016
L-1015	15.000	30.000	15.170	30.170	12.0	23.0	24.1	0.0	19.7	S-016
L-1020	15.000	30.000	15.357	30.357	12.0	24.0	23.3	0.0	19.7	S-016
J-272	15.000	30.000	15.000	30.000	12.0	16.1	13.8	0.0	13.8	L-043
J-273	15.000	30.000	15.000	30.000	12.0	14.9	13.7	0.0	13.7	L-043
J-274	15.000	28.675	15.000	28.675	12.0	12.3	12.1	0.0	12.1	L-043
J-275	15.000	28.655	15.000	28.655	12.0	12.7	12.0	0.0	12.0	L-043
J-276	15.000	26.671	15.000	26.671	12.0	12.0	12.2	0.0	12.2	L-043
J-277	15.000	26.528	15.000	26.528	12.0	12.3	12.1	0.0	12.1	L-043
L-1025	15.000	30.000	15.937	30.937	12.0	41.1	33.5	0.0	19.7	S-016
L-1030	15.000	30.000	15.460	30.460	12.0	40.0	32.0	0.0	19.7	S-016
L-1085	15.000	30.000	15.000	30.000	12.0	41.1	32.8	0.0	19.7	S-016
L-1035	15.000	30.000	15.375	30.375	12.0	39.1	32.7	0.0	19.7	S-016
L-1080	15.000	30.000	15.000	30.000	12.0	37.2	31.9	0.0	19.7	S-016
L-027a	15.000	30.000	15.170	30.170	12.0	38.5	31.5	0.0	19.7	S-016
L-1040	15.000	30.000	15.392	30.392	12.0	37.4	31.5	0.0	19.7	S-016
L-1045	15.000	30.000	15.289	30.289	12.0	42.2	31.1	0.0	19.7	S-016
L-1050	15.000	30.000	15.187	30.187	12.0	33.1	29.9	0.0	19.7	S-016
L-1055	15.000	30.000	15.205	30.205	12.0	32.1	30.2	0.0	19.7	S-016
J-288	15.000	30.000	15.000	30.000	12.0	31.1	30.8	0.0	19.7	S-016
L-1060	15.000	30.000	15.238	30.238	12.0	34.6	30.9	0.0	19.7	S-016
L-1065	15.000	30.000	15.205	30.205	12.0	32.2	32.0	0.0	19.7	S-016
J-291	15.000	30.000	15.000	30.000	12.0	33.8	32.0	0.0	19.7	S-016
B-068a	15.000	30.000	15.000	30.000	12.0	19.8	19.7	0.0	19.7	S-016
B-068b	15.000	30.000	15.000	30.000	12.0	18.8	19.7	0.0	19.7	S-016

Greenbank (Everleigh) Water Supply Network Model

Fire Fighting Report (Ultimate) All Nodes LLZ

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (m H2O)	Pressure (Calculated Residual) (m H2O)	Pressure (Calculated Zone Lower Limit) (m H2O)	Pressure (System Lower Limit) (m H2O)	Pressure (Calculated System Lower Limit) (m H2O)	Junction w/ Minimum Pressure (System)
B-071a	15.000	30.000	15.221	30.221	12.0	16.7	19.7	0.0	19.7	S-016
L-008a	15.000	30.000	15.289	30.289	12.0	30.6	26.2	0.0	19.7	S-016
L-035a	15.000	(N/A)	(N/A)	(N/A)	12.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
T-1010	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-035	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-ECO-005	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-010a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-ECO-006	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-ECO_007	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-ECO-008	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-034a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-040a	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-1075	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)
L-1090	0.000	(N/A)	(N/A)	(N/A)	0.0	(N/A)	(N/A)	0.0	(N/A)	(N/A)